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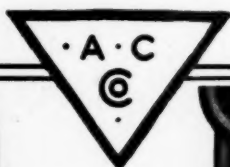
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EDITORIAL

Railway Age

EDITORIAL

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The adoption of cars of high capacity has been one of the most notable recent developments in operating practice on the roads serving the Eastern coal fields. The Norfolk & Western has taken a leading part in developing equipment especially suited for the handling of export coal traffic and at the beginning of the year had in service 1,669 one-hundred-ton gondola cars. After several years' experience with these heavy cars the road has developed a new design which is described in an article by John A. Pilcher, published in this issue. A careful reading of the description of the cars will show how thoroughly the business aspect of operation has been kept in mind by the officers of the road. There are three principal opportunities for saving in the use of large capacity cars. The tonnage per train can be increased due to the lessened number of units and decreased length for the given weight. The number of movements in handling a given tonnage and the number of parts to be maintained is reduced. Last, and perhaps most important, the ratio of load to gross weight can be increased. By the adoption of a truck which supports the load on side bearings, instead of at the center plate, the weight of these cars has been decreased and the ratio of paying load to gross weight increased to 78.9 per cent, an extremely high figure. This equipment is notable, not merely for the engineering features of the design, but also for the manner in which the economic problem has been analyzed and steps taken to insure maximum earning capacity per car, per train and per dollar expended.

Economic Aspects of Car Design

It might well be expected that labor on the British railways would be well pleased with the government's plan for the return of the roads to their owners inasmuch as, under this plan, labor is to be given a hand in the management of the properties. Such, however, is not the case. The National Union of Railwaymen, it appears, is extremely hard to please, and its representatives are now seeking an interview with the Minister of Transport with the view of laying before him their plan for the future organization of the carriers. The union's scheme provides for government ownership and operation under the administration of a board consisting of an equal number of representatives of the government and of the employees. This proposal goes even farther than our own Plumb Plan in its provision for operating the railroads for the benefit of the employees. In a country where organized labor is as strong politically as it is in Britain it would be strange indeed if at least one of the government's representatives were not a strong sympathizer with the unions. A majority on the board, and consequent control of the railways, could well be expected under such an arrangement. The union proposes further that employees discharged as a result of reductions in force should be given "adequate compensation." It would be difficult for any one to surpass in audacity this proposal, involving as it does the virtual turning over of the railways to the employees to be run as best suits their interests. Fortunately, however, for the railways and the people of Great Britain, there is little likelihood that

The Plumb Plan in England

the present government will approve any such proposal. It is to be hoped that the government will, before the return of the carriers to their owners, provide legislation which will protect the shareholders and the public against the unions which are manifestly looking out for their own interests regardless of anyone else.

Transition curves are as little discussed today as the relative merits of the "practical man" and the technical graduate in railway engineering service. The reason is the same in each case—the subject has ceased to be controversial. Although the spiral curve was developed and put to some practical use many years ago, it served for a long time as a fruitful source of contention between those who recognized the necessity for an accurate means of obtaining the gradual change from the tangent to the curve and those who deemed the use of mathematics in this connection as the height of unnecessary refinement. As years have passed by, however, less and less has been heard of this branch of railway engineering so that at present it is almost never mentioned outside the routine of office and field. Believing that a review of this subject could not but develop some interesting and valuable facts the *Railway Age* sent a questionnaire to 42 of the larger American railroads, making inquiry concerning present practices in the use of the transition curve. The result of this is published elsewhere in this issue and goes to show that there is now a very common agreement on the necessity of this refinement in the railway alinement. Railway engineers, including those who responded cheerfully in answering the questionnaire, will find much of interest in this report.

The Transition Curves in General Use

One of the great difficulties in making progress with the improvement in the bad order car situation is the large number of old cars of weak construction which are still in service, many of which should be retired and replaced by equipment of more modern design. The detrimental effect of these cars has been particularly evident during the past year because of the tendency to keep them in service, in the face of the acute shortage of equipment, long after they would normally have been retired. But if the effect of this condition is particularly acute now, the condition itself is by no means a new one. It was the same condition which led to the adoption by letter ballot, following the 1914 convention of the Master Car-Builders' Association, of the provision in Rule 3 of the Interchange Rules which read, "After October 1, 1916, all cars of less than 60,000 lb. capacity, having wooden or metal draft arms which do not extend beyond the body bolster, will not be accepted in interchange." And if we look forward a few years into the future, there is no reason for believing that similar conditions will not then exist. It seems evident that legislation against the recurring specific manifestation of the evil does not remove the cause. One of the strongest incentives for raising the average structural strength of the freight cars of the country which could

Structural Improvement of Freight Cars

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be offered would be the establishment of standard billing prices for labor and material high enough to include a fair commercial profit above the average outlay for labor, material and overhead expenses. During periods of equipment shortage there is little direct inducement to the owner of such equipment to reconstruct it to meet modern conditions because a large percentage of its time is spent on foreign lines where such repairs as it receives are paid for at prices often below the owner's costs for doing the same work, and where failures in transit cost the owner nothing in delays to train movement. An adequate scale of prices established to include a profit, by increasing both the amount and cost of repairs to such equipment, will unquestionably raise the limit beyond which its operation becomes too expensive to be considered.

Intensive studies of fuel conservation, tonnage loading, freight handling, track capacities, the location of facilities,

and many other items, are constantly being made in order to obtain the most efficient service at a minimum of cost. It is pertinent to raise the question, however, whether such studies are not

being conducted by the heads of various departments in a more or less unrelated manner, in contrast with their concentration under the direction of one person who is in a position to co-ordinate these results to the greater benefit of the system as a whole. The busy operating officer is not in a position to prosecute such studies or to gather the facts to support any change or improvement in present day practices. Consequently someone in the organization should be charged with this duty. Such a man should of necessity be familiar with operating, engineering and mechanical problems inasmuch as these are the three departments which are most directly affected by such studies. He must be familiar with train operation over the entire system, the proper utilization of motive power and the effect which various additions made by the engineering department to track facilities will have on train operation and track capacity, if he is to handle the work successfully. Such studies, however, could no doubt better be handled by a committee, with a chairman who may be a signal engineer, as on one road, a mechanical engineer, as on another road, or an operating or engineering officer. It would appear that such a man or committee should be in a position to co-ordinate results obtained by the various departments for the greatest benefit of the road. The preparation of such data for the busy executive officers should prove profitable in a number of ways.

On nearly every railroad in the United States there are widely varying conditions that will and do affect the main-

The Uniform Maintenance of Track

tenance of the track structure. In one case, it may be unstable soil, in another drainage; and in others the character of the ballast, the rail, the traffic, etc. Under such circumstances no two sections, for instance, can be maintained with the same amount of material or the same labor effort, nor can identical results be secured for the same unit cost per mile or per section. Expanded, this is equally true of sub-divisions and divisions. Thus it would seem that, ordinarily, the best sections, sub-divisions and divisions would be those whose natural conditions made it most easy to maintain them. But it is doubtful if this is actually the case in many instances. It is frequently true that the sections that are nearest 100 per cent have reached that condition because of the advantages of better and closer supervision as well as

perhaps a slight "edge" on the prompt delivery of materials and a more adequate supply of labor at most needed times. With such the case the best sections of a road generally continue to remain the best, for it is a natural inclination to favor that which is good, progressive or successful. Thus there is a tendency to continue the wide spread between the best sections and the poorest and this is especially true during periods of limited funds available for maintenance of way expenditures. Such a spread is not desirable from the standpoint of economical railroading, for a railroad is but a correlation of working units and its efficiency depends upon the uniform efficiency of those units. It is chiefly a question of which makes for the better in the long run, a few 100 per cent or nearly 100 per cent sections and many mediocre ones, or as nearly 100 per cent uniformity as can be maintained in practice, on all. In this respect, it is interesting to note, though perhaps not entirely relevant, that a few roads whose maintenance of way slogan has been "Uniformity" have also had uniformly low costs per mile of road when compared to others in the same section of the country.

Huge Deficit of Canadian Government Railways

THE ARTICLE by J. L. Payne on results of government operation of railways in Canada which appears on another page discloses a situation which should be very interesting and extremely instructive to the people of the United States at the present time. Owing to the excessive operating expenses and the unprecedented decline of freight business the railways of the United States have been doing very badly financially since the present freight and passenger rates were fixed. Many persons have persuaded themselves and are trying to persuade others that the only solution of the problem presented is to return our railways to government control.

In Canada, 52 per cent of the railway mileage is owned and operated by the government, and the other 48 per cent, which is made up almost entirely of the mileage of the Canadian Pacific, is privately owned. The same advances in wages and increases of rates have been made in Canada as in the United States. The Canadian railways, fortunately, have not had applied to them the national agreements with the labor unions that are in effect in this country. Under these conditions, as Mr. Payne shows, not a single railway of the system owned and operated by the Dominion Government earned its operating expenses last year. Their expenses were from 109 cents to 410 cents for every dollar they earned. While the Minister of Railways has conceded that the government system had a deficit of over \$70,000,000, Mr. Payne, who was formerly controller of statistics of the Department of Railways and Canals, shows that a proper allowance for interest on the total cost of the railways would make the deficit \$140,000,000. This is \$17.50 for every man, woman and child of the country's population. An equally large deficit per capita for the railways of the United States would be \$1,837,500,000. It must be borne in mind, also, that this deficit was incurred by only half of the railways of Canada.

All the railways of Canada have been very adversely affected by the increases in operating costs, unaccompanied by proportionate advances in rates. The Canadian Pacific, however, under private operation succeeded in keeping its expenses down to 85 cents for each dollar of earnings, and had net earnings of \$33,000,000. The present management of the Canadian government lines is not responsible for the bad financial results. They are partly due to unfavorable conditions which are affecting all the railways of the United States and Canada, and partly to the extremely unwise policy which the Canadian government has followed for fifty years

in building and operating state railways in disregard of sound business principles. Certainly, however, the comparative results of government and private operation in Canada suggest anything but the desirability of consideration of a return to government operation in the United States. What they do very forcibly suggest is the imperative need, in both countries, of government aid to the railways, whether under public or private management, in bringing about a reasonable relationship between operating costs, on the one hand, and earnings on the other hand.

The Menace of the Dust Explosion

THE DESTRUCTION of the large grain elevator of the Chicago & North Western at Chicago on March 19 has directed widespread attention to a menace that has long given deep concern to the owners and operators of these great grain storage structures. The dust explosion represents a hazard against which modern fireproof construction is no protection. The greater and more costly the installation, the greater the potential loss.

The dust explosion is becoming increasingly common in American industry owing primarily to the production of dust in greater volume with the more intensive use of high-speed, automatic machinery and the fact that minute particles of any inflammable material, if suspended in the air in proper proportions, will produce an explosive mixture with tremendous potentialities. The dust explosion does not differ greatly from the gas explosion. In fact, some chemists believe that the process involves the formation of combustible gases by the action of heat on the dust particles, followed by the ignition of a mixture of these gases with air. Very small quantities of dust will suffice to produce an explosion. Experiments show that the explosion of one sack of flour, when mixed with an adequate quantity of air, will develop an amount of energy equivalent to that required to lift 2,500 tons 100 ft.

The study of these explosions demonstrates that they seem invariably to embrace a series of detonations or the progressive ignition of successive clouds of dust stirred up by the preceding detonations. Consequently, deposits of dust serve as a reservoir of enormous reserve energy which intensifies the destructive effect resulting from the initial ignition of the dust suspended in the air. The ignition of this initial blast may be accomplished in so many ways that an attempt to safeguard a structure by measures to prevent the introduction of any spark or flame to set off the explosion is at best an insecure protection.

Casual consideration would point to the wisdom of keeping the structure as free as possible of any accumulation of dust deposits, but this would not solve the problem since it is the dust in suspension which represents the real danger and in the opinion of David J. Price, engineer of dust explosions for the Department of Agriculture, the only effective means of eliminating the hazard of explosions in grain elevators lies in the introduction of dust exhausting appliances at all points in the plant where the grain is in motion. This remedy has been advanced with a full realization of the obstacles imposed to its execution. Not only would this involve drastic alterations of existing elevators and marked changes in the designs of new installations, but still more formidable are the problems of grain weights which would be introduced by the removal of a portion of the weight of the grain in the form of dust. Trade customs with respect to these weights involving the interrelations of the shipper, the carrier and the consignee are circumscribed by rules and statutes that obviously cannot be changed without the united co-operation of a great many diversified interests. In view of all these difficulties it is not surprising that this problem

has not yet been solved, but the situation is realized fully by those who are most intimately concerned with it and active measures are being taken to obtain a solution. This movement should receive the hearty support of the railway managements.

Chicago, Rock Island & Pacific

THE ANNUAL REPORT of the Chicago, Rock Island & Pacific for 1920 is but the story of the railroads of the country as a whole for that year written with the particular problems of the Rock Island in mind. The report shows that the Rock Island in 1920 did the largest freight and passenger business in its history. In view of this fact and the increase in rates during the year, it naturally had the largest gross earnings in its history. On the other hand, as in the case of the larger part of the roads, the net earnings were considerably less than in 1919. The net operating revenue per mile of road was only about one-third or one-half the average for almost any previous year for an extended period.

The report gives some interesting details as to the reason for these results. They are chiefly epitomized in the following statement: "The startling feature of the present situation is that after the government has had your property for nearly three years it comes back to you saddled with an increase in payrolls of approximately \$44,000,000 per annum over the payrolls December 31, 1917, when the property was taken over. Your company now must pay in wages and salaries \$44,000,000 a year more than it paid in 1917. This is about 59 per cent on the outstanding common stock."

The Chicago, Rock Island & Pacific system in 1920 received a total freight revenue of \$94,451,558, an increase of 22.42 per cent over 1919; a passenger revenue of \$35,472,938, an increase of 9.14 per cent, and total railway operating revenue amounting to \$141,946,973. This last figure compared with a total of \$116,624,684, and represented an increase of 21.71 per cent over 1919. The total operating expenses in 1920 were \$133,535,832 as compared with \$101,497,733 in 1919. There was thus an increase of 31.57 per cent in operating expenses as compared with an increase of but 21.71 per cent in operating revenues. The operating ratio in 1920 was 94.07 per cent; in 1919 it was 87.03 per cent, whereas in 1916 it was but 68.10 and in 1917 but 73.70. The total railway operating income in 1920 was \$2,500,565, whereas in 1919 it was \$10,071,099, a decrease of 75.17 per cent.

Referring now to the corporate income account, where are shown the results after the inclusion of the standard return for January and February and the guaranty for March to August, it will be found that the system had a balance of income for 1920 available for dividends amounting to \$4,663,155 as compared with \$4,887,891 in 1919. Full dividends were paid on both the 7 per cent and 6 per cent preferred stocks in 1920 as in 1919, leaving a surplus in 1920 amounting to \$1,095,670, equal to 1.46 per cent on the common stock as against a surplus of \$1,320,988 in 1919, equal to 1.76 per cent on the common stock.

The Rock Island is a system of 8,102 miles, most of which is owned either by the Chicago, Rock Island & Pacific itself, or by its Texas subsidiary, the Chicago, Rock Island & Gulf. Included in its 8,102 miles, outside of the mileage owned there are 262 miles of leased line and 449 miles of line operated under trackage rights. The system's lines extend over a widely extended area; as will be seen from the map this area includes parts of no less than 14 states. Naturally, under these conditions the traffic of the road is quite varied; in 1920, the tonnage consisted of 24 per cent products of agriculture; 21 per cent bituminous coal, or 37 per cent

locomotives. In 1920, however, it purchased and has since put in service 10 Mountain, 15 Santa Fe and 10 Mikado locomotives.

The increase in freight car capacity on the Rock Island has not been as marked as the increase in motive power. The total number of cars owned on December 31, 1920, was 52,757 with a total capacity of 1,799,705 tons and an average capacity of 76,122 lb. The number of cars owned on June 30, 1916, was 50,315, the total capacity was 1,750,630 tons and the average capacity per car 75,634 lb. The Rock Island accepted from the U. S. R. A. 2,000 double sheathed box cars and later purchased from the Administration 500 additional cars.

J. E. Gorman, president of the Rock Island, has some rather interesting remarks concerning the maintenance, or rather lack of maintenance, of the property while it was under federal control. The report shows that the maintenance of way expenses in 1920 were 35 per cent greater than in 1919. The figures of work done, while they indicate considerably more accomplished than in 1919, are hardly to be called excessive as compared with more normal years such as 1916 or 1917. Mr. Gorman's remarks relate to the deferred maintenance of the federal control period (26 months) as compared with an average for 26 months of the test period. He gives a number of details of which the following is an abstract:

For maintenance only	Test Period.	Federal	Deficit
	Average 26 mos.	control 26 mos.	
Cross ties	\$5,125,564	\$3,348,075	\$1,777,489
Switch ties, F. B. M.	10,026,542	6,937,215	3,089,327
New steel rails laid, miles.....	430.49	230.73	199.76
Ballast, cubic yards placed.....	1,315,196	965,652	349,544
Pile trestle bridges built, lineal feet.	49,220	17,455	31,765

Locomotives.—In 26 months of test period, general repairs made to 2,024 locomotives; federal control, to 1,765; a decrease of 259 or 13 per cent. Excess mileage of locomotives between general shoppings 7,872,549 miles greater under federal control than in test period.

Freight Cars, difficult to estimate. During federal control 33.8 per cent on home lines as compared with 61.9 per cent in test period. Cars away from home neglected; estimated increase of 6,705 cars in bad order as compared with beginning of federal control.

Passenger Cars.—During 26 months of test period, 1,424 passenger cars given general repairs as against 1,206 during federal control—decrease 15 per cent.

Mr. Gorman says, "The property was in such splendid physical condition when taken over by the government that even the deficiency in maintenance work shown above has not seriously affected efficient operation, although sooner or later the former high standard of maintenance must be restored." A claim for deferred maintenance has been prepared approximating \$12,000,000.

Mr. Gorman in his report has a great deal to say about the present high wage scales and the handicaps to efficient and economical operation resulting from the National Agreements. It is unfortunate that lack of space prevents the use of some of the pointed examples brought out. However, there is one paragraph that can hardly be passed over; it says, "We believe that railway service should be well compensated, because it requires intelligence, energy, watchfulness and patience of a high order. That the policy of the Rock Island towards its employees has at all times been a fair and liberal one is illustrated by the large number of men who have been in our service for many years—who, so to speak, have grown up on the railroad and have become honored and respected citizens of the communities in which they live. At the same time the present situation, which is not the result of anything done by the company or by its officers, is most burdensome and must be corrected."

The following gives the results of operation in 1920 as compared with 1919:

	1920	1919
Mileage operated	8,102	8,055
Freight revenue	\$94,451,558	\$77,153,311
Passenger revenue	35,472,938	32,502,435
Total operating revenue.....	141,946,973	116,624,684
Maintenance of way expenses.....	26,694,843	19,791,122
Maintenance of equipment.....	34,517,238	26,671,916
Traffic expenses	1,843,282	1,331,860
Transportation expenses	66,708,244	50,347,834
General expenses	3,483,831	2,926,962
Total operating expenses.....	133,535,832	101,497,733
Net from railway operations.....	8,411,141	15,126,950
Taxes	5,894,857	5,046,922
Total operating income.....	2,500,565	10,071,100

The corporate income account is as follows:

	1920	1919
Balance of income (available for dividends)	\$4,663,155	\$4,887,891
Dividends—		
7 per cent preferred.....	2,059,547	2,059,547
6 per cent preferred.....	1,507,938	1,507,356
Total dividends	3,567,485	3,566,903
Balance surplus	1,095,670	1,320,988

Louisville & Nashville

LIKE MOST OF THE RAILROADS of the country the Louisville & Nashville did not have as good net earnings in 1920 as it did in 1919. Perusal of its annual report, issued this week, indicates, however, that it succeeded in coming through the year rather better than most railroads. Taking into consideration the standard return for the first two months of the year and the guaranty for the following six months, the road had a surplus of \$7,758,368 which permitted it to pay quite handily the usual 7 per cent dividends, amounting to \$5,040,000 on its common stock. The surplus available for dividends in 1919 was \$11,086,869. These results, as good as they may be as compared with those of most other roads, cannot, of course, be called satisfactory. Nevertheless they would seem to indicate that the Louisville & Nashville, once the present handicaps in the form of high wage scales and the national agreements are removed, should be able to continue in the future as one of the more prosperous and efficiently operated railroads of the country.

The Louisville & Nashville annual reports do not give a great amount of detail as to the operations of the property during the year covered by a particular report. The lack of these details prevents a detailed analysis of the operating results such as we are able to give in these editorial reviews for most other roads. However, such details as are available either in the annual report or elsewhere go to show what is perhaps already well known—namely, that the Louisville & Nashville is an efficiently operated property and is continuing to show real progress in operating efficiency.

The Louisville & Nashville is a system of no less than 7,696 miles. This does not take into consideration the Atlantic Coast Line, which owns a majority stock interest in L. & N. It does, however, take into consideration the Nashville, Chattanooga & St. Louis, a line of 993 miles which the Louisville & Nashville controls by majority stock ownership; the Chicago, Indianapolis & Louisville, a line of 658 miles, and a majority of the stock of which is owned jointly with the Southern Railway, and also the Georgia Railroad and subsidiary lines in which the Louisville & Nashville is interested as joint lessee. The lines mentioned are each separately operated. The mileage operated by the Louisville & Nashville itself amounts to 5,044. The lines are shown on the map. It will be seen that they extend from Cincinnati and St. Louis south through Kentucky and Tennessee and through the Birmingham district to the Gulf of Mexico with various corollary lines. They cover an extended and pros-

perous area and through their entrance on the Gulf of Mexico at the important ports of New Orleans, Mobile and Pensacola give the Louisville & Nashville a favorable position in traffic from the Birmingham and other districts through the Panama Canal, traffic to South America, etc.

The road is conservatively capitalized. Its investment in road and equipment and in investments in other companies was given as of December 31, 1920, at \$339,463,062. Its outstanding stock, on which it has been paying of late 7 per cent, amounts to \$72,012,117 and its long term indebtedness to \$182,574,282. The company had a corporate surplus as of December 31, 1920, amounting to \$80,489,584. Its interest charges annually amount to slightly over \$8,000,000.

The total freight revenue of the Louisville & Nashville in 1920, as shown in the December monthly statement to the Interstate Commerce Commission, amounted to \$90,686,170, and the passenger revenue to \$26,725,621. The total oper-

creases over 1919. In most cases they exceed the figures for the other roads running in the same territory with the exception, as above stated, of the Illinois Central.

The standard equipment allocated to the Louisville & Nashville by the Railroad Administration included 1,300 50-ton composite gondola and 1,000 55-ton hopper cars, and 18 light Mikado, 50 heavy Mikado, 6 light Pacific and 10 Eight-wheel switching locomotives, all of which were financed through the equipment trust arranged between the railroad, the director-general and the Guaranty Trust Company. In 1920, the road ordered also two Six-wheel switching, 31 Mikado, 12 Eight-wheel switching, and 18 Pacific locomotives, the larger part to be built in its own shops. It ordered also 2,000 55-ton hopper cars and 56 passenger train cars. When this equipment is received the road should be in a favorable position from this standpoint.

H. Walters, chairman of the board, and W. L. Mapother, president, in their remarks reviewing the year's results have this to say concerning the conditions which now confront the property:

"Under the Adamson Act and federal operation, the Louisville & Nashville's actual operating labor payrolls increased \$51,216,022 from \$24,427,677 in 1916 to \$75,643,699 in 1920, equal to 209.6 per cent. During this same period all other expenses increased \$30,239,643, or 172 per cent. Of these other expenses \$19,740,439 are estimated as the increases in the cost of materials and supplies, among which coal increased \$9,790,808 and cross ties \$2,140,277. Since September 1, 1920, all the railroads have suffered from a continuing shrinkage in business. This has become more intense since January 1, 1921, and has reached a point of decline far beyond anything ever experienced before. They are all endeavoring to meet this shrinkage by the exercise of the most rigid economy. The Louisville & Nashville management has seized every opportunity to make savings in the cost of materials and supplies, including coal, lumber and cross ties. Wherever possible train service has been and is being curtailed. Forces of all departments have been reduced by 10,000 men, which still leaves a surplus of more than 5,700 men above those employed in 1916."

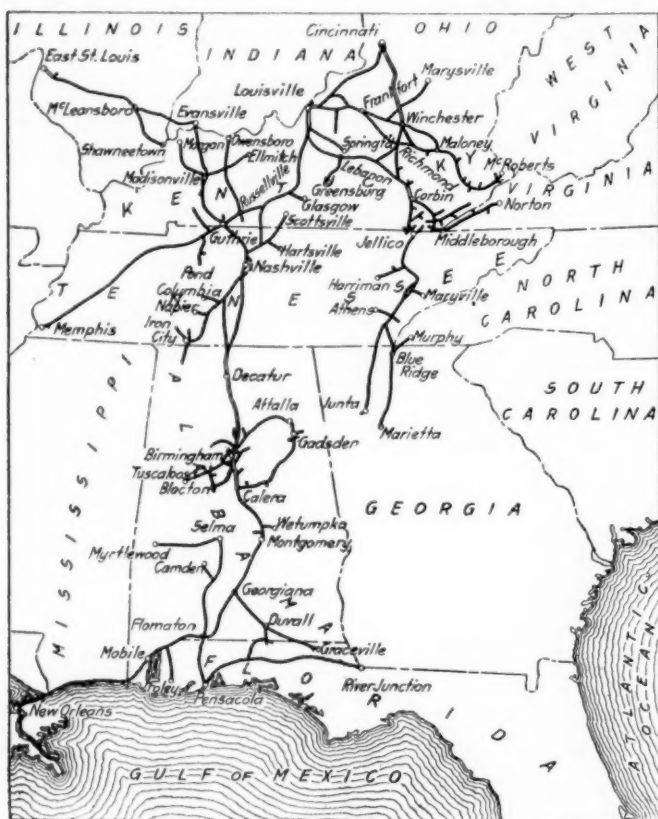
The operating results for 1920 as compared with 1919 follow:

	1920	1919
Mileage operated	5,040	5,033
Freight revenue	\$90,686,170	\$76,828,467
Passenger revenue	26,725,621	24,842,673
Total operating revenue	126,371,693	107,514,965
Maintenance of way expenses	22,607,961	16,098,488
Maintenance of equipment	34,750,294	27,828,958
Traffic expenses	2,108,749	1,454,563
Transportation expenses	38,282,655	44,455,752
Total operating expenses	121,395,811	92,544,137
Net from railway operations	4,975,882	14,970,827
Taxes	3,647,448	3,008,063
Net railway operating income	3,321,221	11,791,845

The corporate income account is as follows:

	1920	1919
Standard return 1919		\$17,298,920
Compensation, January and February	\$2,885,082	
Guaranty, March 1 to August 31	9,194,719	
Net railway operating income, September 1 to December 31	2,062,920	
Gross income	16,877,199	19,979,120
Net income	7,863,651	11,176,281
Dividends (7 per cent)	5,040,000	5,040,000

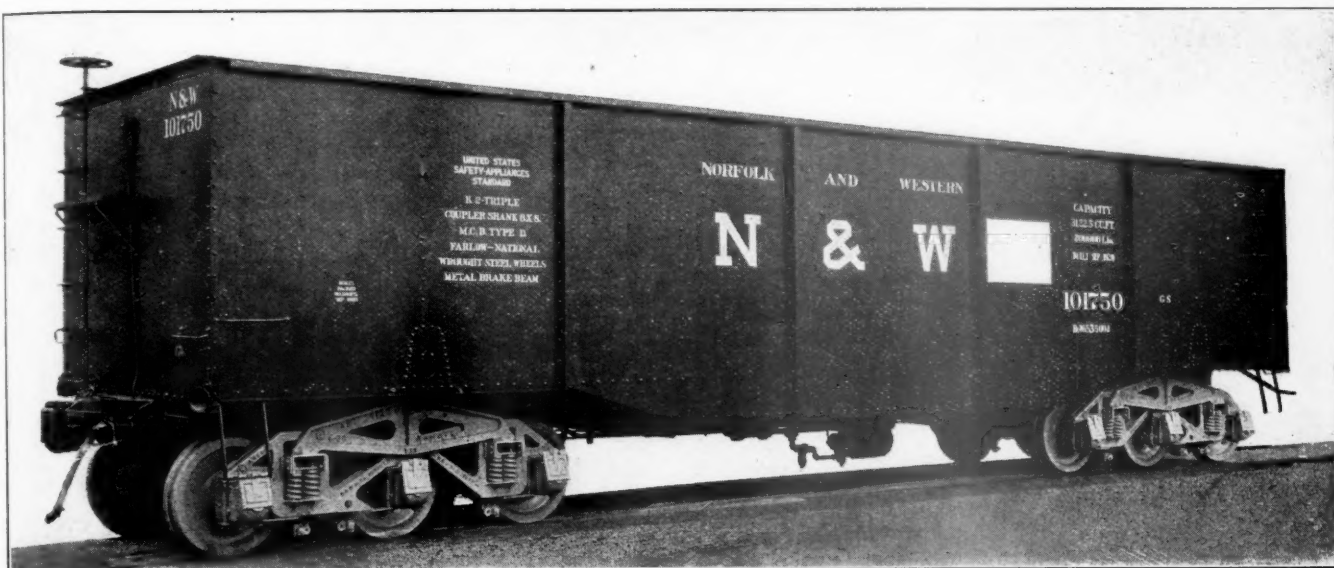
TRADE COMMISSIONER Louis E. Van Norman reports that the Polish government, with the object of encouraging home industries, has recently signed contracts with a number of engineering firms in Poland for the delivery of large quantities of rolling stock for the Polish railways within the next 10 years. Obviously, these firms will need foreign capital and assistance to enable them to carry out the orders. For their first deliveries they will have to rely on importation from abroad of wheels, springs, and locomotive parts. Eventually it is their intention to execute the orders completely in Poland.



The Louisville & Nashville

ating revenues were \$126,371,693 as compared with \$107,514,965 in 1919. The total operating expenses in 1920 were \$121,395,811 as compared with \$92,544,137 in 1919, the operating ratio in 1920 being 96.06 per cent. The net railway operating income in 1920 was \$3,321,221; in 1919 it was \$11,791,845. The standard return for the property while it was under federal control was \$17,310,495; the Louisville & Nashville was one of the few roads which earned its standard return in 1918, when the net railway operating income amounted to \$19,568,935.

The Louisville & Nashville has been doing rather better than most of the roads in southern territory when it comes to average car load, average train load, etc. It has not succeeded, however, in rivaling the Illinois Central, which of late has been making some rather enviable records. The average train load on the Louisville & Nashville in 1920 was 531 tons; the average number of tons per loaded car amounted to 30.5; the car miles per car per day to 30.6 and the ton miles daily per car to 613. These figures all represent in-



New Norfolk & Western 100-Ton Coal Cars

Body Supported on Side Bearings Instead of Center Plate—New
Type Six-Wheel Truck

By John A. Pilcher

Mechanical Engineer, Norfolk & Western

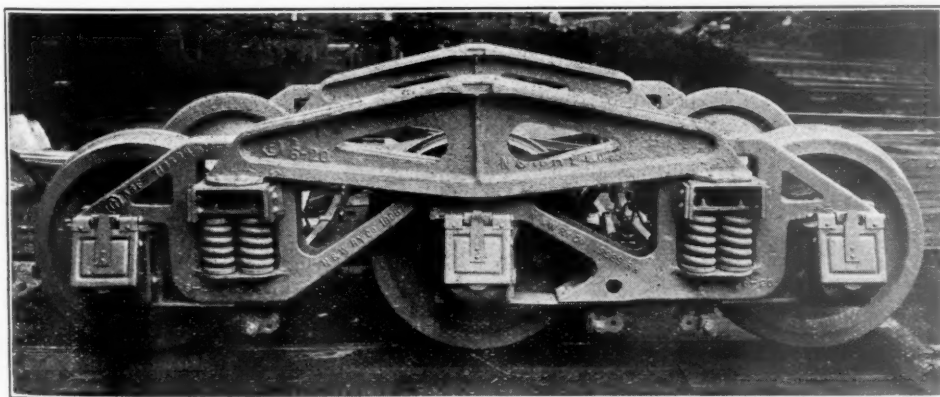
THE LIGHTEST CAR for its load carrying capacity ever built for heavy train service is illustrated in the accompanying drawings and photographs. An order of 500 of these cars is now nearing completion at the Roanoke shops of the Norfolk & Western, under the supervision of A. Kearney, superintendent of motive power. The advantages of a car of such light weight can be judged from an estimate of the cost of operation prepared in connection with this

ries the load on the side bearings instead of on the center plate. This arrangement not only gives perfect equalization of loads between the wheels at all times, but reduces the oscillation of the car to a minimum and contributes very materially to the lightness of both body and trucks. The average weight of car and lading is very near 253,500 lb., the A.R.A. limit for a six-wheel car with $5\frac{1}{2}$ in. by 10 in. journals. The general dimensions and weights of the car are

shown in the tabulation. The equipment applied to this order includes wrought steel wheels. Miner friction draft gear, type A-18-S, with Farlow single key horizontal yoke draft attachments. Four hundred of the cars are equipped with Westinghouse K-2 triple valves and 100 with the Automatic Straight Air brake. The brake rigging has one brake beam per axle. The hand brake, arranged with a quick take-up, is geared to give braking power equivalent to the air brake.

The truck is of the three-axle, articulated type, mainly of cast steel, with two side frames on each side, secured together over the center boxes. The boxes used are the regular A.R.A. standard, although the design lends itself readily to the use of the semi-pedestal type of box, now in very general use. It is the lightest six-wheel truck of this capacity ever constructed. The pair of trucks weighs 24,480 lb.

The springs are so located in the frames as to give equal load distribution on the wheels when equal loads are applied to each group of springs. Beams made to straddle the frames



Side View of the New Type Truck, Which Carries the Load on the Side Bearings

design. It has been computed that if all these cars could be kept running at the same rate that the first one operated for the first three months, (about 90 miles per day), the additional earnings over those of the previous large capacity cars built by the Norfolk & Western, would pay for them in five years. This accomplishment is due in part to the light weight of the trucks and body and in part to the larger cubic capacity.

The special feature of the design is the truck which car-

reach from one group of springs to the other, on each side of the truck, and support the weight of the car at their centers. This gives an equal load on each group of springs. The beams rest upon and are secured to spring caps, tying them

together lengthwise of the truck, and are themselves side members of a rectangular, cross-braced centering spider, which serves to hold the two sides of the truck together and

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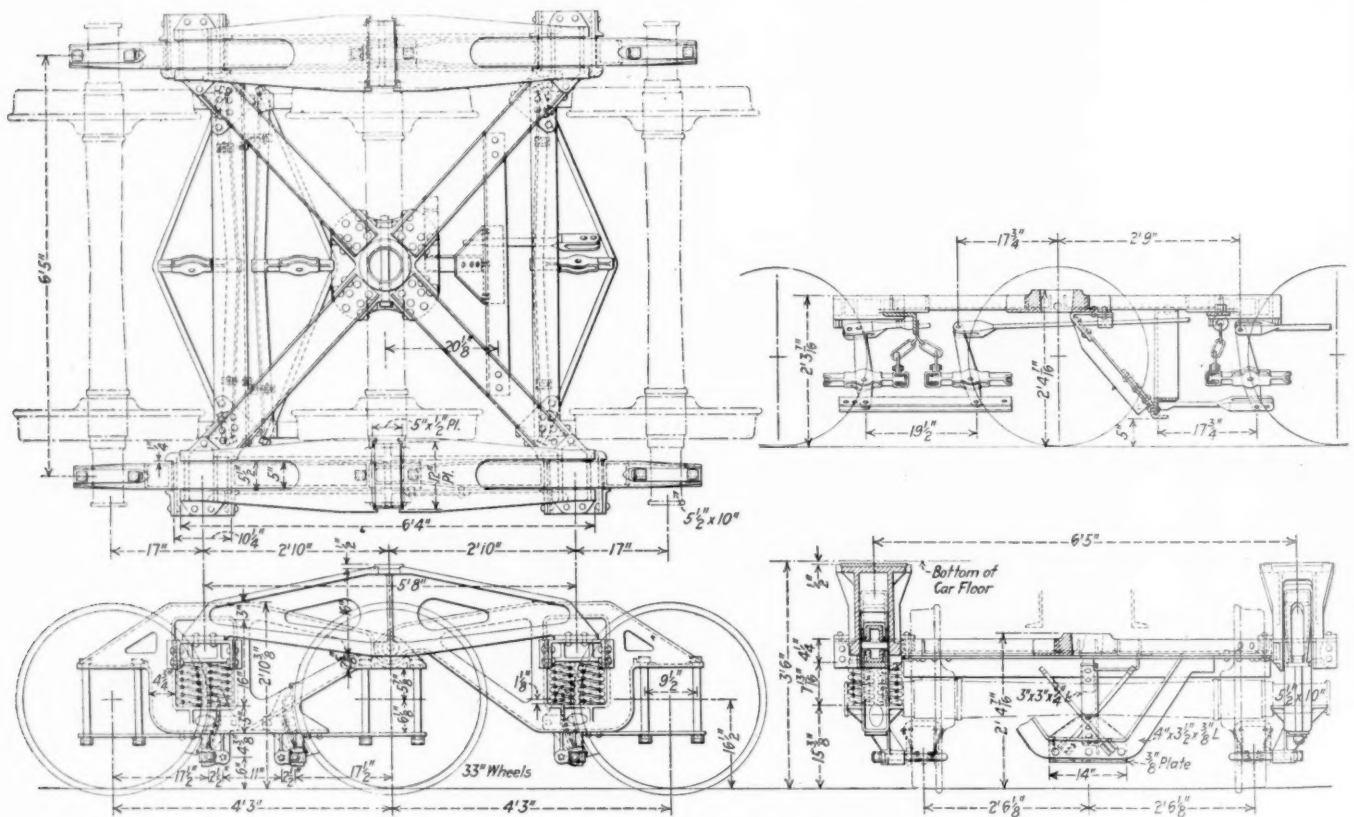
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PRINCIPAL DIMENSIONS AND WEIGHTS OF NORFOLK & WESTERN 100-TON COAL CAR

Length over striking plates.....	43 ft. 9 in.
Coupled length	46 ft. 2 in.
Truck centers	31 ft. 8 in.
Truck wheel base.....	8 ft. 6 in.
Height from rail to top of car side.....	11 ft. 0 in.
Height of center of gravity (loaded with 200,000 lb.).....	81 in.
Inside length	42 ft. 7 in.
Inside width	9 ft. 6 in.
Outside width	10 ft. 1 1/4 in.
Cubical capacity—level full	3,122.5 cu. ft.
Cubical capacity—30 deg. heap.....	513.5 cu. ft.
Cubical capacity—including heap	3,636 cu. ft.
Revenue load	200,000 lb.
Weight of car body	29,020 lb.
Weight of two trucks	24,480 lb.
Weight of empty car.....	53,500 lb.
Total weight, loaded with 200,000 lb.....	253,500 lb.
Per cent revenue load of total weight.....	78.88 per cent
Weight per foot coupled length.....	5,491 lb.
Weight of one truck	12,240 lb.
Rail load per pair of wheels.....	42,250 lb.
Density of load of 200,000 lb.....	55 lb. per cu. ft.

together lengthwise of the truck, and are themselves side members of a rectangular, cross-braced centering spider, which serves to hold the two sides of the truck together and



General Arrangement of the Six-Wheel Truck

in proper relationship. The truck is thus held square. The cross bracing holds the guide for the centering pin on the car body. The keepers, riveted to the outside of the spring caps, and the projecting lugs cast on them coming inside the frames, are the guides to hold the frames together and apart. The carrying beams, straddling the frames, are riveted to the top of spring caps and serve in a like capacity.

The design, which is light in weight, readily gives the strength to resist forces in any horizontal direction. One of the cross-tie members is made of an angle to give it stiffness and permit the attachment of the dead end of one of the

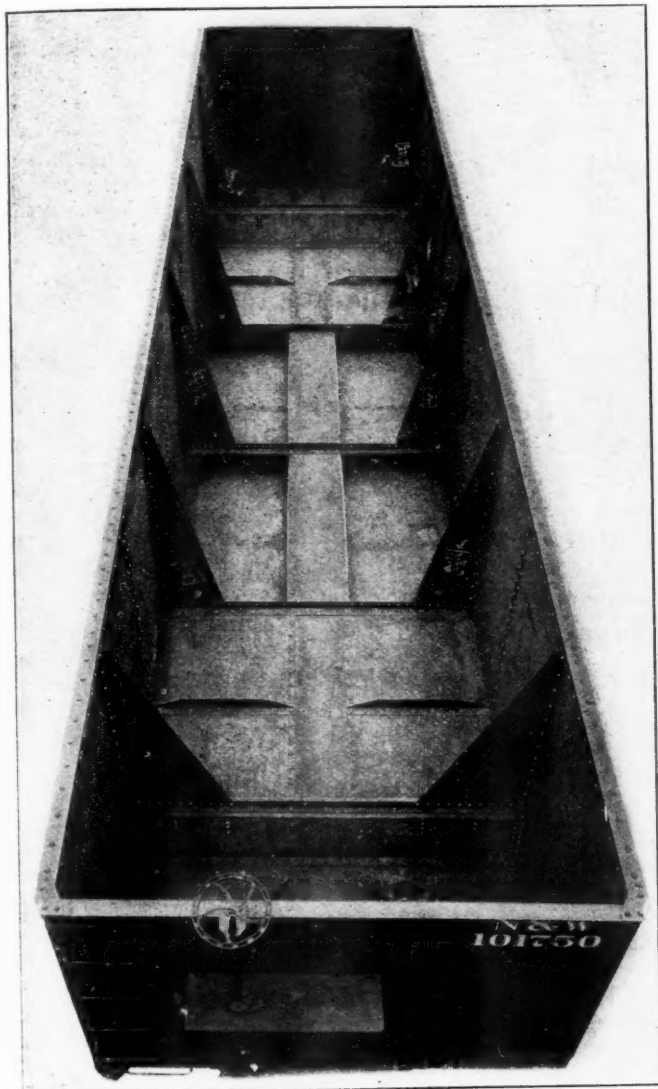
designed to meet these conditions. Careful tests were made by fastening three corners to a rigid frame and raising and lowering the fourth corner by means of a rail gaging machine with a stroke of 1 1/2 in. Two corners were tested, being subjected to 80,000 and 100,000 reversals of stress respectively. Measurements of the stresses showed that only a relatively small differential of loading at the corners will overcome the vertical stiffness of the spider and the unit stress is so low that there is little danger of fatigue failures in ordinary service.

The use of the side bearings placed over the center of the

truck side frames for load carrying, obviates the necessity for the strong, heavy bolster members from side to side of truck, supporting the load at its center. This not only decreases the weight of the truck, but also decreases the weight of the car body bolster, in that it does not need the strength to carry the load from the car side all the way to the center, but only for the very much shorter distance to the points over the truck side frames.

The Car Body

The general drawing of the car and the arrangement of the body bolster show the location and details of the load carrying conical rollers. Only enough of the middle section

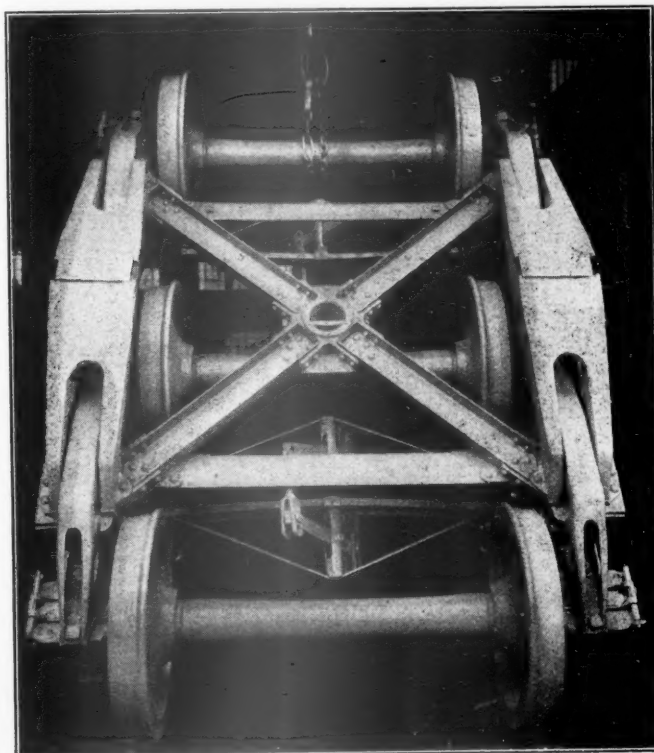


Interior of the Car Body

of the conical roller is used to provide sufficient lateral movement at the roller for the car to negotiate a 35 deg. curve. The bottom of the roller is limited in its lateral movement by the sides of the opening in the bottom of the car through which the roller projects. The body bolster is made hollow to allow room for the roller. The bottom face of the roller is set in a horizontal plane normal to lines of load forces, in order that there may be no horizontal components tending to displace the load-carrying side beams on the truck. The projections on the bottom side of the roller at each end serve as guides for proper placing. Normally these projections should not come into action for holding the bottom of the roller in place on the truck side beam.

The upper sides of the conical rollers incline toward the center. The lateral component of reaction against the inclined surface on the roller seat is taken up by compression in the body bolster and tension in the rod tying the two opposite rollers together. In case anything should happen to this rod, these reactions will all be within the roller seat itself. The outside end of the roller seat is made of sufficient strength to take care of these forces. The tie rod passing through a slotted hole in the inside projecting lug on the seat serves to hold the rollers in place in case the car is jacked off the trucks. The roller is guided on its top side by the pocket in the seat. It is cast of high carbon steel and bears against hardened-steel plates, top and bottom. It is made long and of large diameter, reducing to a minimum the probability of flattening the contact surfaces.

The use of conical rollers of large size makes this approximately an anti-friction bearing, and reduces to a minimum



A View of the Truck from Above, Showing the Centering Spider and Beams Spanning the Side Frames

the forces needed to rotate the truck under the car. Any slight flattening of the contact surfaces that might occur after a long period of service would only very slightly increase the forces needed for the turning. Even if after years of service the surfaces should flatten to an objectionable extent, the renewal of rollers and seats is a simple and comparatively inexpensive operation.

The roller seat at its top side conforms to the shape of the inside of the bolster plates and distributes the load over a large portion of the surface, requiring very little riveting to hold it. The holes in the sides of the car are used for entering and securing the tie rod connecting the rollers. They are reinforced on the inside of the side plates with bracket castings and furnish a place for a special hook provided with the wrecking outfits, for lifting the car body in any emergency. Some such arrangement is necessary since the use of ordinary hooks indiscriminately at any point on the loaded car would give such heavy concentration of loading as to tear and mutilate the car body.

A tee is used to increase the section of the top flange of

the bolster girder, and its top extending web serves for the attachment of the bolster gusset plate. This gusset plate connection with the side of the car, together with the beaded angle at each end of the bolster, connecting the bolster web plates with the car side, transfers the load coming from the car side through the body bolster to the roller seat, without undue concentration at any point. The car body bolster is placed above the car floor line so as to give room under the car for the supporting beam on the truck over the center box and truck side frames. This allows reasonable depth and economy in the design of the beam.

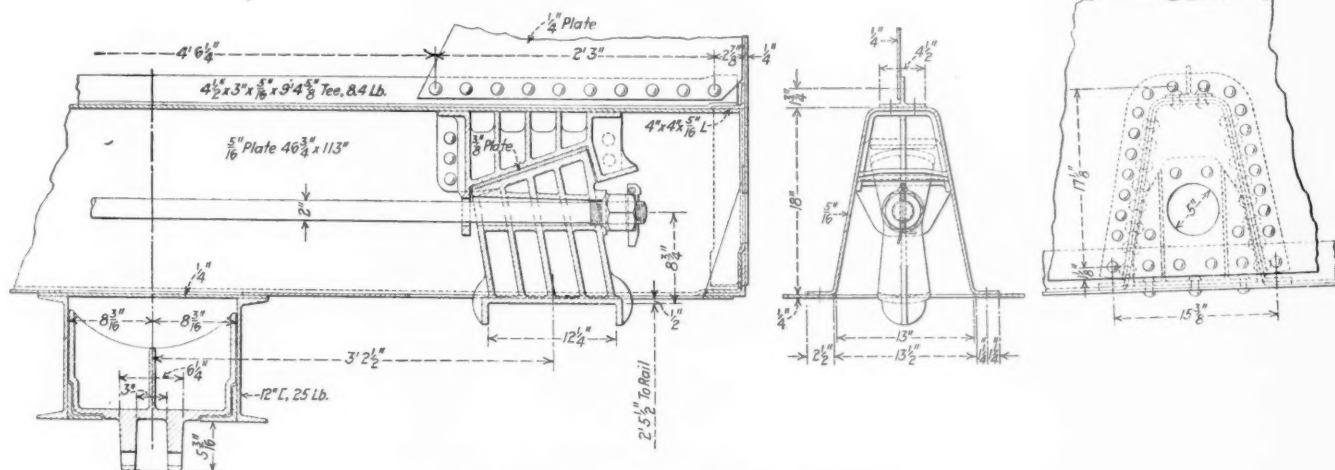
On a hopper car the hollow bent plate bolster can be placed in the same relative position to the truck without being placed above the inclined floor of the car. The centering casting on the car body is integral with the draft gear back stop. The holes receiving the pin fastening together the body and truck center castings are slotted in order to allow the necessary angular movement between truck and car. There is no normal vertical movement between these two parts.

The center portion of the car, between trucks, has the bottom placed on a line with the bottom of the center sills, thus gaining additional cubic capacity and slightly lowering the center of gravity. The cross diaphragms in the car framing become the ends of the depressed bottom. On the outside

the track, without undue stresses within itself, and without great differences in the load pressure on the four supporting points. This would not be possible with a closed-top, rigid car body. When such a rigid car body is used, a method of cross equalization on one end of the car must be introduced with a truck of this type.

Observations made on previously constructed large open-top cars, in connection with the adjustment of the side bearings, indicated there would be no difficulty in supporting such a car on four points. In fact, with the close adjustment of the side bearings, to prevent excessive rocking, the car body had, in a measure, to accommodate itself to the changes in the plane of the track, and has been doing this for a number of years without any apparent detriment.

Some experiments were conducted with the object of determining just to what extent such a car body could be warped out of its normal plane without detriment, and without excessive changes in the loading on the four points of support. The first tests were made on a flat bottom gondola, both empty and loaded. The car body was brought to a level plane resting on four groups of calibrated springs. By measuring the height of these springs, the load on each corner could be determined. Liners of various thicknesses were then placed on top of the springs at diagonal corners



Arrangement of Body Bolster and Conical Roller

of the car, short pieces of tee section, the same as the side stakes, are placed so as to come opposite the cross diaphragms and bear against the car dumper blocking, supporting the car at a strong point of reaction. The side stakes and top coping angles serve the same purpose.

The vertical corner angles connecting the side plates of the car with the end plates have the flanges attached to the end plates turned out, so that the projecting edge of this flange, together with the edge of the plate riveted to it, will bear against the dumper blocking, thereby helping support the weight of the car and lading and protecting the grab irons from injury. Both the corner push-pole pocket and reinforcing bracket casting, under the center of the body bolsters, furnish places for jacking and stooling the car. The general details of construction can be understood from the drawings.

Car Body Support

A car body resting, as does this one, on four points of support, two on each truck, on rollers, allows for the vertical angling between the plane of the truck and plane of the car in passing the sharp vertical curves of the tracks leading to the dumper. These four points of support also make it necessary that the car body be measurably flexible, in order that it may accommodate itself to the changes in the surface of

so as to bring the car body to a warped plane. Readings were taken with several different adjustments. The maximum warp in the car body for the light car was 3 in. off the plane of the other three points and on the loaded car, 2 1/2 in. The maximum change of load at any one point during the test was 5,834 lb., a little more than 10 per cent of the load on any one point. Similar tests were made on the empty body of a 100-ton hopper car. The results were similar to those made on the 90-ton car, but the readings indicated that this car body was erected with about 1 1/2 in. or 2 in. warp out of the true plane.

On the completion of the first new side bearing supported car an additional series of winding tests was conducted, both with the car on blocks and mounted on its own trucks. This car body also was found to have a warp of about 2 1/2 or 3 in. The results bear out the previous test for winding on the car body and show conclusively that an open-top car of this character can be carried on four points of support and conform itself to the changing plane of the track without undue stress and without marked change in relative loading on the four points. About 400 of these cars are now in regular service and nothing has developed to indicate other than the deductions given above.

Before the first car was delivered for regular service, it was tested for clearance between the truck and car in curving

up to curves of 35 degrees using for this purpose a conveniently located turntable. One truck was placed in a fixed position on the turntable, with the other truck moving along the track as the table was turned to the extreme point the clearance between the truck and car would allow. By using the diagram shown in the drawing, and reading the movement of the turntable in inches at its circumference, the angular difference between car and truck and the corresponding curvature in track over which the car could run without fouling, was readily determined.

Security Owners' Position Defended

THE ACTION of the National Association of Owners of Railroad Securities in meeting with representatives of the "big four" brotherhoods on April 4 was defended by Haley Fiske, president of the Metropolitan Life Insurance Company, in a letter addressed to A. H. Smith, president of the New York Central, which was made public on April 11. Mr. Fiske is a member of the sub-committee of the Association which met with the employees' representatives and his letter was in reply to a letter of the previous week from Mr. Smith to S. Davies Warfield, president of the Association, in which the action of the Association in calling the meeting was characterized as "unfortunate" (*Railway Age* of April 8, page 904).

Mr. Fiske in his letter warned that "the present truculent attitude of some railroad administrations toward the operatives and the unions" is a "mistake which may lead to disaster." Mr. Fiske stated further that it was "disturbing to find" Mr. Smith and the New York Central directors resenting the action of the Association to protect its interests. Furthermore Mr. Fiske said that his associates have met with "rather violent antagonism" in their "efforts to promote helpful legislation, which, now that it has been passed some of your people are taking credit for."

Mr. Fiske's letter follows:

When we read in the newspapers to which you sent it in advance of its receipt by the addressees your letter of March 31 to Mr. Warfield and Mr. Stone we were disposed to reply in as sharp a tone as that displayed by you. But it seemed better to take the matter under cool consideration. Now, after the lapse of a week, we feel that we should make protest.

This company holds securities of your railroad and its subsidiaries to the amount of nearly \$23,000,000 par value, and in addition has on its books loans and agreements to loan over \$9,000,000 on bonds and mortgage upon real estate to finance your operations in the neighborhood of your terminal. Altogether our financial interest amounts to \$32,000,000. This is about 15 per cent of our total investment in railroad securities.

Frankly, it disturbs us to have your board of directors say that they represent in their dealings with the present condition of affairs the stockholder, without any recognition of the superior obligations of the railroad companies. It may very well be that as matters are now threatening the stock will become a rather negligible quantity; the bonds will never become so. Our interest in your company is a vital one. It is very disturbing to read that you are disposed to ignore this interest. It is even more disturbing to find yourself and the board resent any action on our part to protect our interests. We have seen no disposition on your part to recognize our interests or to consult with those who in a sense own your property. On the contrary, we have seen in the past rather violent antagonism to our efforts to promote helpful legislation, which, now that it has been passed, some of your people are taking credit for. None of the railway managements has thought it wise to seek any counsel or to recognize in any way the serious situation in which we find ourselves. On the other hand, you are objecting—if you will pardon us for saying so—in an offensive, not to say impertinent way, to our endeavor to protect our own investments. We feel that we had a right to expect co-operation and help rather than opposition.

Your assumption that in seeking a conference with the labor representatives, the most important element in the present problem, we are pretending to represent you or your board was quite unwarranted. We very frankly put our real position before these organizations and the public. We think the present truculent attitude of some railroad administrations toward the operatives and

the unions a great mistake which may lead to disaster; and that it is time that all concerned in the properties should show some conciliatory disposition, at least to the extent of endeavoring to get the point of view of labor and to seek some method of negotiation to end the present impasse.

And now that our conference is over, we feel that we have accomplished much. In our opinion it is time that all of the interests—the investors, administrators and operatives—get together, and that it is not a time for recrimination.

New York Public Service

Commission Law

THE LAW OF NEW YORK STATE reorganizing the public service commissions of the state was briefly noted in the *Railway Age* of April 1, page 862. A single commission has authority throughout the state except that a separate commission, the Transit Commission, has jurisdiction over elevated and subway railroads, surface railroads and stage or omnibus lines lying wholly within New York City; also, within the city, over street railroads whose lines may extend outside; and over local service, within the city, on all railroads.

The law consists wholly of amendments to the existing law as it was framed in 1910, which law, as affecting railroads, was based on the act passed in 1907. This last mentioned act was printed in full in the *Railroad Gazette* of May 31, 1907.

The new public service commission, sitting at Albany, and taking the place of the present commission for the second district, is to consist of five members, the governor designating the chairman. The term of a commissioner is ten years and he is removable only on the consent of the legislature by a two-thirds vote. The Transit Commission consists of three members with terms of five years each. These are removable in the ordinary way, by the governor. The salaries of all eight commissioners are \$15,000 each.

The public service commission is to regulate not only railroads, gas companies, lighting companies, heating companies, etc., as has been done heretofore, but also omnibus routes (except in New York City).

The public service commission is to maintain a branch office in New York City and the offices of both commissions, as now, are to be kept open from 8 a. m. to 11 p. m. The secretary of each commission is to receive a salary of \$6,000.

One of the important reasons for the enactment of these revisions at this time was to relieve the critical financial condition of the subway and elevated railroads in New York City; and the Transit Commission is empowered to authorize an "immediate, reasonable, temporary" increase in fares. This power is granted also to the public service commission as related to all carriers, and includes authority to fix rates for fares and freight "notwithstanding a higher or lower rate has been prescribed by a general or special statute, contract, grant, franchise condition, consent or other agreement." The Transit Commission, however, dealing wholly with New York City, is subject to restrictions requiring co-operation, with city authorities in the revision of any of the existing contracts between the railroad companies and the city.

The public service commission has power to revise prices of gas and electricity in general on the same terms as the authority granted in connection with railroad rates.

Article VI of the present act consists of ten pages setting forth additional powers and duties of the Transit Commission, and providing for co-operation with the city authorities.

The ROUMANIAN GOVERNMENT has signed a contract with the government of Austria for the rental of 100 locomotives and 2,000 cars.

Canadian Government Railways Incur Heavy Losses

Deficit, Including Interest on Entire Investment, Over \$140,000,000
a Year—Operating Ratios 109 to 410 Per Cent.

By J. L. Payne

Formerly Comptroller of Statistics, Department of Railways and Canals of Canada

TO THOSE WHO READ the analysis which I offered in a preceding issue* of the deficit on the Canadian National Railways group for the current year it will be obvious that a capital liability of \$2,284,125,057 could scarcely fail to produce the fixed charges of \$106,301,744 assigned to it. That would represent an interest rate of but 4.65 per cent, which is rather low. There are, however, rents, taxes, interest on floating debt and so on, attaching to 22,500 miles of line to be added; so that suspicion of exaggeration could not reasonably arise. Moreover, it must be borne in mind that nearly \$400,000,000 has been contributed to the total liability since 1914 in government advances to acquired roads, apart from several hundred millions on account of the Intercolonial and Transcontinental, and probably half of that amount, if not more, will bear a rate up to or over 6 per cent. Late last year \$50,000,000 was borrowed on long term notes in New York at 7 per cent.

These more modern advances by the government suggest at once one of the most distressing features of this whole matter. Let us agree it is mere fatality, whatever some might be disposed to say as to other reasons, that the government has found the burden growing at a truly alarming pace year by year since this huge scheme of nationalization was given effect. Proof of that growth is found in the steadily rising volume of cash aid which the government has been obliged to give. The Minister of Railways is now before Parliament with a request for \$168,000,000 on this account, which omits \$35,000,000 borrowed a few months ago on notes. These two sums are equal to nearly 50 per cent of the total revenue of the Dominion. It is actually \$31,000,000 in excess of the total national receipts for 1916.

It is the swelling character of this load which makes the situation so grave and causes such acute apprehension for the future. Last year the deficit was nominally placed at \$47,000,000; this year at \$70,000,000. At that rate of progression the burden would soon be disastrous. It is unbearable now, and measures of relief must be found. If all other conditions remain stationary, it will be seen that the capital additions for the year alone will raise the deficit next year by upwards of \$12,000,000 by reason of new fixed charges.

Operation Ratios of 109 to 410 Per Cent

The weakness of the various units composing the Canadian National group may be gathered from one or two comparative statements which will be peculiarly enlightening to railway men. Take the operating ratio, for example. In the report of the deputy minister of railways, issued this year for the first time, the position of the various units is shown in that regard to have been as follows in 1919-20:

Canadian Northern.....	112.08	Moncton & Buctouche.....	231.86
Canadian Government.....	114.52	Elgin & Havelock.....	285.69
Canadian National.....	113.14	St. Martino.....	409.60
Intercolonial.....	108.95	York & Carleton.....	326.59
P. E. Island.....	167.55	Salisbury & Albert.....	257.61
International.....	280.78	St. John & Quebec.....	205.07
Transcontinental.....	125.63		

While these names will be a little puzzling to American readers, and it is not worth while trying to explain them, the figures which are opposite to them are significant. These roads are all included in the Canadian National system, and

the ratio of operating expenses to gross earnings as shown must be measured against, say, 75 per cent in determining the measure of unsoundness. That is to say, no road which goes beyond 75 per cent can be regarded as healthy, unless the conditions are quite exceptional. This adverse showing is in part explained by the fact that the moment a small line is taken over by the government, standard rates are charged instead of local, and an immediate shrinkage of revenue takes place. Of course, while that explains the cause in small part, it does not alter the financial aspect in the slightest; and we are here merely concerning ourselves with the facts in their relation to the total burden upon the people.

The situation is not bettered when earnings and operating expenses per mile of line are considered. Here are the facts for 1919-20:

	Earnings	Expenses
Canadian Northern.....	\$5,558	\$6,230
Intercolonial.....	17,755	19,344
Prince Edward Island.....	3,335	5,588
International.....	1,673	4,698
Transcontinental.....	5,804	7,292
Moncton & Buctouche.....	1,682	3,900
Elgin & Havelock.....	857	2,449
St. Martino.....	616	2,523
York & Carleton.....	1,458	4,761
Salisbury & Albert.....	1,330	3,426
St. John & Quebec.....	965	1,980

In fact, no matter from what angle the problem is approached the financial aspect shows up discouragingly. While that aspect has been peculiarly worsened as the result of exceedingly adverse conditions affecting all railways in North America, it is more serious on the government road than on others. I do not care to discuss probable reasons. That the people did not know how bad it was is due in part to the system of accounting which has been followed—or lack of system. A very large annual deficit, which should have been specifically assigned to the government railways, was scattered about in the public accounts, chiefly in the form of charges connected with the national debt. What has here been done in large part, has been to bring all such liabilities out of the places where they did not belong and put them where they did belong. This has not to the extent of a penny increased the actual loss. It has merely revealed and consolidated it in its proper place.

In keeping with the orthodox plan, sanctioned by ancient precedent, the minister of railways announced the other day that the deficit would be "about" \$50,000,000; but, he added, that figure "did not include certain fixed charges." He did not hint at the probable volume of those charges. He followed the pattern set by his predecessors and left the facts to be assumed. That has been the course followed for two generations. Several days later, and just as this article is being sent out, he has definitely placed the deficit for the past year at \$70,331,734. But his call for appropriations aggregating \$168,000,000 and the realization that this sum may bear some relationship to the real deficit on the Canadian National Railways when all factors have been reckoned, has profoundly stirred the whole country. There is an insistent demand for information. As has already been said, the newspapers have taken up the matter in a spirit of earnest enquiry. As many columns are being written these days about the railway situation as were lines in the times when this vast liability was in process of

*Railway Age, April 8, p. 883.

accumulation. Just what may develop out of this new attitude of the public no one may say at this moment.

Business Men "View With Alarm"

The first shot has been fired by the Board of Trade of the ancient city of Quebec. At a meeting held on the afternoon of March 15, the following resolution was adopted and telegraphed to all sections of the country:

"That the Quebec Board of Trade views with alarm the recent declaration of the Honorable the Minister of Railways, in the House of Commons, to the effect that last year's operation of railways by the government would result in an increase of the public debt of Canada to the extent of \$140,000,000, to meet the deficits in the operation of these railways and to provide additions to their equipment and betterments.

"That this board, in common with other commercial bodies in Canada, has repeatedly expressed to the government its disapproval of the policy of government operation of railways.

"That the policy of the management of the government railways in diverting the grain trade of the west to New York for export, and, by means of prohibitory freight rates, preventing this grain from coming to Canadian seaports for shipment, is most reprehensible and unpatriotic, and has resulted in the payment of many millions of dollars of freight money to United States railways, that should have been earned by Canadian railways, and if so, would have gone a long way to reduce the alarming deficit under government operation which all now deplore.

"That it is impossible for Canada to go on meeting losses of this magnitude, which in a few years might seriously impair the credit of the country, and this board is of opinion that the government should seriously consider the future management of the Canadian Northern railway, before going any further with regard to the acquisition of the Grand Trunk."

The protests to which the foregoing resolution makes reference are not available at the moment. Under any circumstances, they were taken as a matter of course, and did not arouse any particular feeling in the country. It would seem that a great change has suddenly taken place in that regard. Today a marked spirit of inquiry, suggesting a determined desire to know the truth, whatever it may be, is in evidence. Out of this public awakening may come some new constructive policy. I am not disposed to speculate upon the probable character of that policy. All sorts of suggestions are heard, some of them extremely radical. There is even some hint from labor circles of the expediency of trying the Plumb plan, with which the people of Canada are wholly unfamiliar at the present time. There would not seem to be the slightest probability of that being done; but as to what else may be urged, as the matter more and more engrosses public thinking, I could only guess.

Government Ownership Never

Submitted to Public Consideration

That such stupendous events should happen without the question of state ownership having been submitted to public judgment will naturally surprise your American readers. Yet I have tried to make it clear under what extraordinary circumstances the present government railway system was brought into existence. While all well-informed men knew that it would be a costly business for a time, there was no doubt a general expectation that the weakness of the Canadian Northern would give place to strength as time proceeded. Few people realized how desperate was that weakness, or how much would be required to bring it up to a sound operating position. Its traffic density was exceedingly low, and it was one of the poorest equipped roads in the world. Equipment costs a great deal of money today. The Canadian Northern was not, however, essentially weaker than was the Grand Trunk Pacific, because of the tremendous capital cost per mile of the latter. It amounted to \$104,000 per mile, now greatly increased by government advances. These two roads ran parallel for hundreds of miles and competed for traffic which either could have handled.

If there is any one fact in connection with the whole Canadian railway problem which stands out as an example of state blundering it is to be found in the creation of these two rival systems. Neither could have been financed without public help, and to a large extent both were constructed on state credit and under state auspices. The volume of private capital put into these roads was relatively small. If there had been a careful survey of the transportation needs of the West, and a policy of progressive construction adopted as those needs became real rather than prospective, it is just possible these two systems could have found a place in western Canada. As it is they both occupy practically the same territory, showing slow development of traffic.

It has not been a pleasant task to write this story. It is dismal and distressing. But, if a personal explanation will be pardoned, it has been my life work to study matters of this nature, and it has seemed to me that I was in a peculiarly favorable position to present the facts. That has been my sole purpose. Not a syllable has been written about the broad principle of public ownership. That is an issue which has never arisen in connection with the Canadian railway problem—at all events not before the people. If there had been a deliberate choice of the present plan as against the corporate plan, then, quite properly, a great many pertinent conclusions would seem to be suggested; but I have left the drawing of deductions from the Canadian experience to others. As for myself, I have written wholly without prejudice. My own judgment as to what might have occurred under capable corporate management is decided; but has no place in this review.

Whole Country Is Aroused

It is perhaps unfortunate, in some respects, that my analysis of the situation had been completed, and much of the foregoing matter actually written, before the Minister of Railways presented his annual statement to Parliament on March 17. Had his figures been available to me, instead of merely the advance press abstract, I should have adopted them as more or less authentic—at all events as not being open to question by his department. Any difference that exists between his calculations and mine clearly shows that I have understated rather than overstated the facts, and I would rather have it that way. If what he omits is brought into the reckoning, as I have tried to do in a judicial spirit, it will be seen at once that the burden now resting on the Canadian people as the result directly and indirectly of railway nationalization is well over \$140,000,000 a year; for the press statement, which bore all the stamp of official authenticity, placed the operating deficit for the fiscal year 1920 at \$21,250,000, while the Minister later enlarged it to \$36,842,970. The difference between these two figures must be added to my calculation of the probable deficit for the current year, and it will be seen at once that it is thereby raised to considerably over \$140,000,000.

Parliament is in session, and it seems there is a movement on foot to take the matter out of all party controversy. It is felt that the situation is far too grave to be discussed in the ordinary way. One of our leading newspapers implies that the very life of the nation is involved in the finding of a practicable solution. The supporters of the nationalization idea have hitherto been discounting adverse results as due to conditions purely temporary in character, and it must be confessed that the fine optimism growing out of that view was shared more or less by the people at large. Now there is a great change. Until, however, time has been given for the evolution of some definite policy it would be idle to speculate. As a matter of fact, I have not the remotest idea what will even be proposed. All I know is that the whole country is aroused, and that everybody is convinced there must be a vital change. When the people take a hand something is likely to happen.

President Urges Reduction of Transportation Costs

Mr. Harding Continues Conferences—Meets Labor and Security Owners' Representatives

WASHINGTON, D. C.

PRESIDENT HARDING, in a brief discussion of the railroad situation in his address to Congress on Tuesday, probably disappointed numerous believers in legislative panaceas when he declared that "railway rates and the cost of operation must be reduced" without recommending any additional legislation to accomplish such a result. Probably a more definite feeling of disappointment was caused among those who have been shouting for rate reductions regardless of costs by the fact that he coupled the two in such a way as to carry the thought that a reduction of costs is perhaps a necessary precedent to a reduction in rates.

The President also made it plain, if there had been any doubt on the subject, that his mind has not been turning in the direction of another experiment in government operation as a possible solution when he said: "If we can have it understood that Congress has no sanction for government ownership, that Congress does not levy taxes upon the people to cover deficits in a service which should be self-sustaining, there will be an avowed foundation on which to build." He had previously referred to "government operation in heedlessness of cost" in referring to the period when railway deficits were being covered by taxation and in his reference to the merchant marine he had urged "government encouragement, not government operation."

He made clear, however, his opinion that freight carrying charges are too high—he did not mention passenger rates specifically—but he referred to the low tide of business as a cause of the present difficult transportation situation rather than as an effect, as so many have preferred to consider it.

The part of President Harding's address relating to railroads read as follows:

The great interest of both the producer and consumer—indeed, all our industrial and commercial life, from agriculture to finance—in the problems of transportation will find its reflex in your concern to aid re-establishment, to restore efficiency, and bring transportation cost into a helpful relationship rather than continue it as a hindrance to resumed activities.

It is little to be wondered that ill-considered legislation, the war strain, government operation in heedlessness of cost, and the conflicting programs, or the lack of them, for restoration have brought about a most difficult situation, made doubly difficult by the low tide of business. All are so intimately related that no improvement will be permanent until the railways are operated efficiently at a cost within that which the traffic can bear.

If we can have it understood that Congress has no sanction for government ownership, that Congress does not levy taxes upon the people to cover deficits in a service which should be self-sustaining, there will be an avowed foundation on which to rebuild.

Freight-carrying charges have mounted higher and higher until commerce is halted and production discouraged. Railway rates and costs of operation must be reduced.

Congress may well investigate and let the public understand wherein our system and the federal regulations are lacking in helpfulness or hindering in restrictions. The remaining obstacles which are the heritage of capitalistic exploitations must be removed, and labor must join management in understanding that the public which pays is the public to be served, and simple justice is the right and will continue to be the right of all the people.

President Continues Conferences

No suggestion was made that any plan of action which has been urged upon the President during his recent conferences on the railroad situation has yet commended itself to him and there was no indication as to whether he has more faith than some others have as to the willingness or ability of the Railroad Labor Board to function in time and in the

right way to help remedy the situation or as to whether he has in mind some plan not yet matured which he proposes to discuss later. He has consulted with the chairmen of the Interstate Commerce Commission and the Railroad Labor Board and with representatives of the labor organizations and of the bondholders but he was to begin his discussion with the representatives of the managerial chiefs of the roads on Wednesday with T. DeWitt Cuyler, chairman of the Association of Railway Executives.

President Harding has continued his conferences with labor leaders on the railroad situation and in addition to those previously mentioned, he conferred on April 6 with W. L. McMenimen, deputy president of the Brotherhood of Railroad Trainmen, and on April 9 with L. E. Sheppard, president of the Order of Railway Conductors. He had previously talked with B. M. Jewell, representing the organizations affiliated with the American Federation of Labor, and with W. S. Stone, representing the engineers, and W. S. Carter, representing the firemen. It is understood that the heads of the train service brotherhoods advocated the plan they had previously discussed with the railroad executives, for regional agreements and regional boards of adjustment, which was referred by the Association of Railway Executives to the railroads in the various districts.

Security Owners Representatives

Confer With President

Darwin P. Kingsley, president of the New York Life Insurance Company, and S. Davies Warfield, president of the National Association of Owners of Railroad Securities, conferred with the President on April 8 as members of the executive committee of the association. They were also members of the special committee that conferred with the heads of the train service brotherhoods and other organizations at New York on April 4 and they urged upon the President the plan that has been advocated by the "big four" brotherhoods for a discussion of the wage questions by bi-partisan regional boards. This differs from the plan proposed by Mr. Jewell and his associates, who have urged the President to call a conference of the railroad executives and of the labor leaders for the purpose of discussing a national adjustment. Mr. Warfield and Mr. Kingsley, however, insisted that wage adjustment is only part of the problem and called attention to the Warfield plan put forward by the association as a means of effecting other economies. After the conference a memorandum left with the President by Messrs. Warfield and Kingsley was made public, as follows:

In your intensive study of the railroad problem we respectfully direct your attention to these facts:

You are aware that for the months of January and February—and a similar result is forecasted for March—the railroads of the country, as a whole, are not earning, by many millions, sufficient to pay the interest on their bonds and other outstanding debt.

This condition cannot continue without numerous receiverships with far-reaching effect. The resulting reorganizations would cause great loss not alone to owners of railroad securities but in other values. The alternative of a legislative suspension of legal proceedings through a national railroad moratorium or of temporary relief through large additional government loans, are necessities to be avoided if humanly possible. Further suspension of earning power is fatal.

The situation is of peculiar concern to the investment institutions of the country, its savings banks and life insurance companies particularly. Many millions of people are dependent upon the current payment of interest on the railroad securities owned

by them. A prolonged suspension of the payment of interest on the bonds of a great number of railroads would materially lessen the ability of these institutions to meet their requirements.

If this emergency continues much longer, the bonds must be drawn actively into the situation; and bondholders' protective committees will become necessary for the protection of the various classes of securities affected by the conflicting equities of receiverships or suspended payments. This will add to already greatly disturbed conditions.

Representatives of the railway executives' association ascribe the trouble to wages and working conditions; representatives of the employees insist that the fault lies largely with inefficient railway operation.

The suggestion is heard that railway managements if left alone will produce results—meaning reduction in wages sufficient to enable the roads to meet their obligations.

There has been unnecessary delay, friction, and a sacrifice of the merits of the question to controversies over procedure. There is lack of co-ordination between railway managements and the employees. Policies have been adopted, reversed, rescinded and new policies started through the same process.

The National Association of Owners of Railroad Securities represents in its membership nearly \$12,000,000,000 of railroad securities, largely bonds. It is the means through which the security owners, as a body, are collectively heard. In the present crisis we could not stand by and await the inevitable result without an endeavor to ascertain at first hands the causes for the existing conditions before urging intervention upon your Administration which alone can secure immediate results. Since September 1, 1920, the drift toward the present difficulty has been constant and progressive.

To ascertain if the results indicated can be avoided, the association of security owners, through its executive committee, after reviewing the contentions of representatives of the railway executives' association and the general procedure advocated, named a special committee to confer with those who represent large numbers of railroad employees. One of the principal impediments to a settlement is the lack of proper understanding between the roads and those who work upon them. There has been wholly unnecessary delay and uncertainty as to procedure, with lack of appreciation of the real questions in controversy. We believed our known attitude toward intensive economies in railroad operation would guarantee to those we were to meet the sincerity of our approach.

The conference has been held. It covered a wide ground and the conclusions of the committee representing the security owners are that a solution can be found and a just settlement arrived at. We suggest that properly called meetings between the men and those representing the railroads be held, under the auspices, if you think proper, of the existing governmental agencies—the labor board and the commission. Perhaps these bodies will co-ordinate their efforts, in some degree, in this emergency.

We are on record that wage adjustment is only part of the problem. That this should be attained under circumstances carrying assurance to railway workers that whatever may be fairly brought about is reasonable and just. This was one of the reasons for presenting our statement to Senator Cummins on March 21, in advance of his proposed investigation.

It occurs to us that it is not an unreasonable position on the part of those representing the men that deficiencies in revenue should not be met by wage reductions alone unaccompanied by evidences of the definite intention to bring about obligatory general economies.

The association of security owners is now preparing the data for suggestions of economies to be laid before the committee of the Senate which will review existing railway conditions. We believe that fundamental economies can be effected. We feel that in justice to the shipper and railway labor, they must be inaugurated. We have stood definitely committed to that program since January, 1919. This however takes time. That program cannot become finally effective without the co-operation of the necessary governmental agencies, including Congress.

We believe that affirmative action on the part of the administration in calling upon the managements and the employees to discuss and settle differences that are not composed on the individual roads will be effective. A multiplicity of trials before the labor board will not accomplish the result in time to avoid major damage.

If assured that your administration will urge an adequate program of economies, accompanied by legislation to that end, we believe that in the cases in which an agreement cannot be reached with an individual railroad management, that the employees would enter into immediate discussion of their differences by regional boards, equally divided, formed by each of the four groups of railways as now arranged by the commission for ratemaking purposes. Procedure of this character is encouraged and contemplated by the Esch-Cummins act. It would avoid endless hearings and clogging of the dockets of the labor board,

which means perhaps fatal delay. Your intervention, Mr. President, along the lines suggested can put an end to the impossible conditions that now exist and which threaten the financial structures of the railroads with serious consequences.

Thomas DeWitt Cuyler, chairman of the Association of Railway Executives, with Alfred P. Thom, general counsel of the association, called upon the President on Wednesday by appointment for the purpose of handing in the six names from which the President, as provided in the transportation act, will select one for appointment to fill the vacancy in the management group on the Labor Board, which will occur on April 15, and also to discuss with the President the general railroad situation.

After the conference Mr. Cuyler stated that he, of course, could not repeat what had occurred in the interview as it was manifestly proper that the President should not be quoted and should himself determine whether any and what statement should be issued; but that the President had discussed the railroad situation quite fully and had shown a complete grasp of the problem, to which he had evidently been giving most careful and earnest consideration. The President listened with interest to all the views which were presented, which necessarily covered the entire railroad situation, including revenues and expenses, wages and working conditions, and other matters vitally affecting the railroads and the public.

A group of employees' organizations has nominated J. J. Forrester for re-appointment to the Labor Board.

Banker Urges Regional Boards

The attention of President Harding has been called to the concern felt by the savings banks because "the railroads as a whole are not even making their bond interest," in a letter addressed to him by G. E. Brock, president of the National Conference of Mutual Savings Banks and president of the Home Savings Bank of Boston. This letter was made public on April 11. It is further stated that "we have had altogether too much red tape in procedure before the Labor Board" and that the attitude of the "representatives of a great number of railroad employees" is fair and shows "a desire of compromise." Mr. Brock closed his letter with a statement to the effect that "regional discussion between railroad officials and representatives of the employees will solve this problem."

The letter follows:

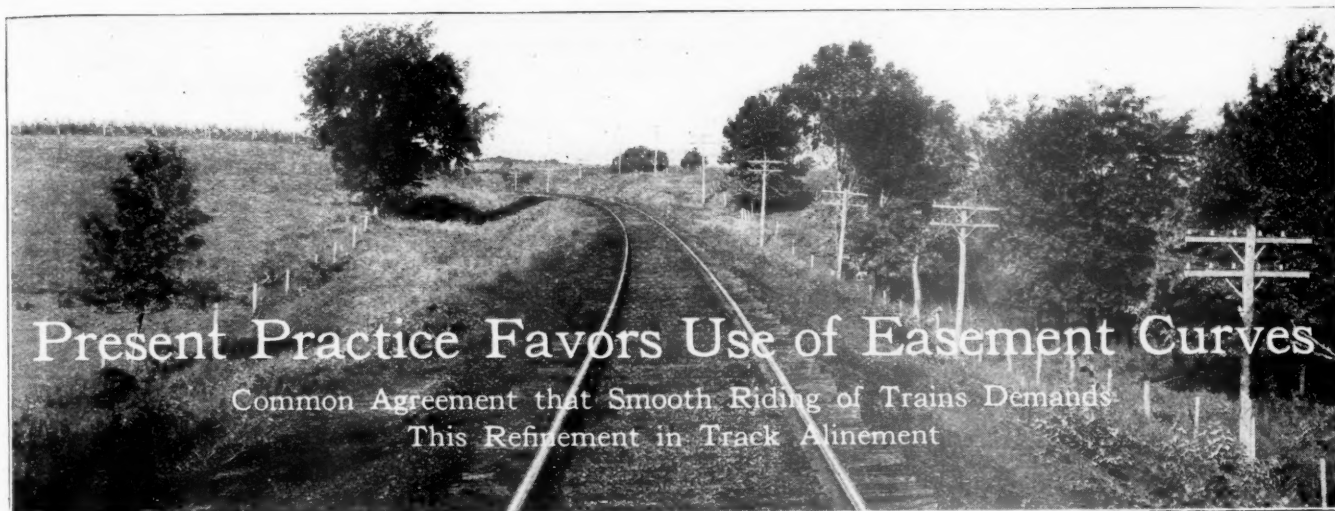
The railroads as a whole are not making their bond interest, so we savings bank people are much concerned. A great many of the workers on the railroads are depositors in savings banks and many millions of them have what are known as industrial policies of insurance on their lives. We believe they realize that what adversely affects railroads must adversely affect them. This is apart from the pay they receive from the railroad.

I have no sympathy for those who have in their keeping the billions of securities belonging to the people we represent who do not interest themselves in a crisis like the present to the extent of knowing from first hand what is going on and what the trouble is. We have had altogether too much red tape in procedure before the Labor Board. We now need co-operative suggestion and action.

The attitude of those we met who represented great numbers of railroad employees was fair and showed a desire of compromise and the distinct wish to prevent a catastrophe in the railroad world.

I was glad to see that Mr. Warfield wrote you and presented to you the views of those of us who are active in the situation in representing our institutions with their great investment and that something constructive was suggested by these two gentlemen to you, to which I trust you will give great consideration.

Regional discussion between railroad officials and representatives of the employees will solve this problem. For it will lead to regional boards created by the four groups of railroads which have now been formed by the Interstate Commerce Commission. This proposition is a fair one. Such regional boards would not be used until after the railroad manager of each road sees the road employees. It would secure prompt action and enable disputed points to be promptly taken up. Those not settled shall then go to the Labor Board at Chicago.



Present Practice Favors Use of Easement Curves

Common Agreement that Smooth Riding of Trains Demands
This Refinement in Track Alinement

A RESUMÉ OF THE practice of representative railroads shows that the use of the transition, easement, spiral or taper curves, as they are variously called, is now almost universal for main line railways. This is in direct contrast to the conditions 25 years ago when the prevailing differences as to the advisability of providing any form of easements gave rise to frequent controversies. From a study of the present attitude toward this matter, it would seem that the intervening years, during which the subject received decreasing attention in technical papers or articles, have witnessed a general acceptance of an accurately located taper, founded on more or less rigid mathematics, as the only satisfactory means of accomplishing the transition from a tangent with the rails on the same level to a circular curve properly superelevated.

The present virtual unanimity of opinion in favor of easement curves has been brought out in a questionnaire recently addressed to the larger railways of the United States and Canada to which replies were received from 39 systems, covering an aggregate mileage of 190,000 miles of line. It is entirely possible that this general acceptance of the easement curve as a necessary feature of railway alinement accounts for the scant attention which this subject has received in recent years, either in pages of the technical journals or by engineering societies.

An insight into the attitude of railway men a quarter of a century ago is obtained from an article in the *Railroad Gazette* of May 24, 1895, where Walter Loring Webb presented a summary of replies which he received from 18 leading railroads in answer to a questionnaire he addressed to them on this same subject. Other contributions and editorial comments appearing in the same volume of that periodical showed that this subject was then one of live consideration. Estimates based on information available at that time indicated that only about twenty-five per cent of the railroad curvature of the country had been provided with easements.

Believing that a knowledge of the present practices with respect to this particular feature of railroad engineering would be of interest and value to railway engineers and maintenance of way officers, the president of one of the eastern railroads, who in former days took an active part in the introduction of transition curves, suggested to the *Railway Age* that this subject presented a fertile field for investigation. In pursuance of this idea the following questionnaire was addressed to the chief engineers of forty-two railroads in this country and in Canada, replies to which were received from thirty-nine of the railroads which were addressed.

Questionnaire Regarding the Use of Easement Curves

To what extent do you employ easement curves?

What type of easement curve do you employ?

Do you use easement curves for all degrees of curve, or do you restrict their use to curves of a certain degree or sharper and if so, what degree?

Is the length of easement curve based upon the train speed as well as the degree of curve and if so, how?

Is the easement curve established by your engineer corps or by the supervisors?

Is the use of the offset method or the method by deflections given preference?

Do you employ the string method of establishing easement curves in existing tracks?

Are the limiting points of the easement curves defined on the ground by permanent markers and do these carry the date as to full elevation and rate of run-off?

Are easements introduced at the time a new line is constructed or subsequently?

The replies have been tabulated in the large chart in as near the form in which they were received as was possible. Practice as regards matters of this kind is not subject to abrupt modification. Consequently, we find that the replies received from three officers of the Canadian National reflect the individual practices of the several lines absorbed in this system. Similarly, it has been found desirable to tabulate the replies received from the four regions of the Pennsylvania system so as to show the practices as they have prevailed on the lines east and west of Pittsburgh.

Use of Spirals Almost Universal

By far the most pertinent fact disclosed by this chart is that all the roads reporting except one, the Chicago & North Western, make some use of transition curves. On one other road the use is characterized as "limited," this being the Pere Marquette, a road with a relatively high proportion of light traffic branch lines. The extent of the use of spirals, as reported by the 38 lines which use them, is somewhat varied, but in general it may be said that they are used on main-line, high-speed tracks in nearly all cases. The classification of these lines as tabulated is as follows: On all lines, 4; on practically all lines, 9; on main lines and important branches, 2; on main lines, 7; on high speed tracks, 6; "limited use," 1; replies indefinite, 9.

Another field for variation in usage relates to the minimum degree of curvature for which it is deemed necessary to provide easements. The replies to this question are classified as follows: On all curves of 1 deg. or over, 11; curves of 1 deg. 30 min. or over, 1; curves of 1 deg. 45 min. or over, 1; curves of 2 deg. or over, 11. The replies received from six roads indicated a more elaborate classification. Thus, the Canadian Pacific spirals all curves of 2 deg. or over on main

lines, but only curves of 4 deg. and over on branch lines. On lines of the Pennsylvania System west of Pittsburgh, all curves of 2 deg. or over are spiraled, but on lines carrying trains at speeds in excess of 40 miles per hour, the minimum limit of curvature is reduced to 0 deg. 45 min. Obviously, the faster the speed the greater the refinement necessary in easements. However, a study of the table does not show that the roads handling a larger proportion of high speed traffic

are given to providing spirals for flatter curves than roads with slower trains.

Many Forms of Spirals in Use

The spiral dates back to early days in railway building. Rankine made references to it. Wellington developed some simple approximations. In 1880 the Holbrook spiral was first made public and in 1882 Searles published the first

SUMMARY OF PRACTICE WITH RESPECT TO EASEMENT CURVES

Road	On What Lines	On What Curves	Type of Easement	Length Determined by	Laid Out By Whom	Offsets or Deflections	Is String Method Used?	Use of Markers With Curve Data	When are Easements Introduced
A.C.L.	-	2°+	Talbot	elevation	engr.	defl.	no	no	construction
B. & O.	main lines major br.	1°+	Talbot	elevation	engr.	defl.	for checking	yes	construction
B. & M.	generally	all	Cub.Par.	degree of curve	engr.	defl.	no	no	-
Can.Nat.East	wherever possible	1°+	Holbrook	degree of curve	engr.	defl.	no	no	construction
Can.Nat.East	-	1°+	four types	practice varied	engr.	defl.	no	no	construction
Can.Nat.West	practically all	2°+	Holbrook	degree of curve	engr.	defl. preferred	very seldom	when re-ballasting	construction
C.P.R.	-	2°+ (main) 4°+ (br.)	Parabolic	elevation	engr.	defl.	no	yes	new lines
C. & A.	all main lines	2°+	Searles	50' per in. elevation	engr.	defl.	no	stakes	construction
C. & E.I.	for speed of 30 m.p.h.	1° to 2°+ dep. on speed	Grandall	60' per 1" elev.	engr.	defl.	no	without data	-
C. & N.W.	not used	-	-	-	-	-	-	-	-
C.B. & Q.	all new lines old where prac.	1°+ and 2°+	A.R.E.A.	1" to 1 1/2" per 33' rail	engr.	defl.	optional	without data	construction
C.P.N.	all lines	1°+	Cub.Par.	for 30 m.p.h.	engr.	offset	no	without data	construction
C.M. & St.P.	main lines	1°+	Talbot Searles	L = VE	engr.	-	no	no	construction
C.R.I. & P.	all new lines realignment	2°+	Berry	speed	engr.	defl.	no	yes	construction
C.C.C. & St.L.	-	1°+	various	speed curvature	engr.	defl.	no	yes	construction ballasting
D.L. & W.	all main lines	2°+	Talbot Searles	speed and judgment	engr.	defl.	for checking	stakes	construction
D. & P.C.	nearly all lines	2°+	Searles	1" per rail	engr.	defl.	no	stakes	construction
Erie	all construc. & reconstruc.	1°+	Talbot	degree of curve	engr.	defl.	not gen.	without data	construction or reconstruc.
G.N.	all main lines	2°+	Cub.Par. Talbot	speed	engr.	offset	limited	yes	construction rebalasting
I.C.	-	2°+	No standard	elevation	engr.	both	no	no	construction
L.V.	all curves	all curves	A.R.E.A.	elevation	engr.	defl.	emergent	no	construction
L. & A.	all main lines	1°+	Searles	40' to 60' per in.	engr.	defl.	for checking	without data	construction
M.C.	where speed over 40 m.p.h.	all curves	Talbot	elevation	engr.	defl.	no	without data	construction
M.St.P. & N.O.M.	new lines and reconstruction	2°+ 1 30'+(spl)	Searles	degree of curve	engr.	defl.	no	no	construction
M.P.	all but minor branches	1° 45'+	Talbot	degree of curve	engr.	defl.	exceptional cases	yes	construction
N.Y.C. east	almost all lines	1°+	Cub.Par.	degree of curve	engr.	defl.	no	without data	construction
N.Y.C. west	all lines	0° 30'+ main 1°+ branches	Cub.Par.	usual 200'	engr.	offset	no	without data	construction
N.Y., N.H. & H.	high speed lines	1°+	Stephens & chord	L = VE	engr.	defl.	no	without data	construction
N. & W.	generally since 1906	2°+	Wentworth Searles	Searles & Wentworth	engr.	-	no	yes	construction
N.P.	generally	-	Searles	L = 1/2 VE	-	-	-	yes	construction
Penna.East	all high speed	not restricted	No standard	33' per 1" elev.	supvr.	offset	yes	no	when track is laid
Penna.West	all lines	all 2°+ (over 40 m.p.h.) 0° 45'+	Grandall	60' per 1" elev.	engr.	defl.	no	yes	construction
P.M.	limited use	2°+	Talbot	-	engr.	defl.	-	yes	subsequently
P. & R.	main high speed	1°+	Cub.Par.	on elev.	engr.	both	no	without data	construction
St.L.-S.F.	class A	all	Talbot	60' per 1" elev.	engr.	defl.	no	yes	construction
Southern	main line	all	Sullivan	degree of curve	engr.	defl.	no	yes	after completion
S.P.	all new lines great part old	1° 30'+	Hood	judgment	engr.	defl.	no	without data	construction
U.P.	-	-	-	30' or 33' per 1" to 5/8"	engr.	-	-	no	construction
Wabash	on major lines	2°+	-	degree of curve	engr.	defl.	no	no	subsequently

edition of his "Railroad Spiral"—"to reduce the well known theory of the cubic parabola or multiform compound curve to a practical and convenient form." Since then a multitude of variations have been developed and put to use on the different roads.

In 1911 the American Railway Engineering Association adopted for inclusion in its manual of recommended practice an easement curve devised by J. B. Jenkins, valuation engineer of the Baltimore & Ohio, which is known as the 10-chord spiral, but from the results of this investigation it would appear that this effort of the association to effect uniformity of practice has not been as successful as has been the case with some of the other standards published in the manual. Only two roads report the use of this particular form of spiral; of the other replies, 11 name the Talbot spiral; eight favor the Searles transition curve and 11 use the rather general term "cubic parabola." Three replies do not indicate a preference for any particular type of curve while the others report a variety of easement so that, in all, curves with 12 different names are mentioned.

This variety may be explained in part by the fact that the true cubic parabola is a matter of intricate mathematics, approximations of which are to be had in a variety that affords a most fertile field of operation for the mathematician. Without doubt the 10-chord spiral of the American Railway Engineering Association has not received as wide a use as is warranted by the merits of this particular form of transition curve. Failure to apply it must, therefore, be ascribed to other causes. For instance, it may be suggested that the presentation of this transition curve in the manual is not as attractive nor in as detailed a form as the characteristic expositions of easement curves commonly appearing in the handbooks of field engineering.

As the railroad taper is of necessity a matter of more or less intricate mathematics, it is not surprising that the replies from all roads favor the employment of engineers for the application of the tapers to the alignment. In noting that the answer of the Pennsylvania System, eastern lines, contains the word "supervisors," it should be recalled that on that road the supervisor is an engineer in nearly all cases. In the same connection it is of interest to note that under Method of Application, 28 of the roads favor the method of deflections, four the method of off-sets, two express no preference, while four give indefinite replies. On this point, William Hood, chief engineer of the Southern Pacific, states that careful work by the off-set method requires more time than the deflection method.

The question as to the use of the string method of lining spiral curves received only one unqualified affirmative reply and that from the Pennsylvania System, eastern lines. This method is not used at all on 25 roads, it is used only occasionally on five and it has supplemental or emergency use on four. Since the replies to the questionnaire were in nearly all cases received from the chief engineers of the railroads, it is entirely possible that "unofficial" use of the string method may be more extensive than these replies would indicate.

How the Length of Spirals Is Determined

Another important matter in the discussion of spirals is the determination of the length, which involves a number of considerations, among which the most important is the distance required for an easy run-off of the superelevation. On new location in easy country, there is no limit on the length to which the easements may be extended. In difficult country a long spiral introduces complications as will be explained later. There are also limitations on the lengths of spirals when they are being introduced on old lines, since long spirals increase the difficulty of fitting the curve to the old roadbed.

Broadly speaking, this problem involves the inter-relation of curvature, speed and superelevation which are not properly a part of this discussion. Consequently, the question concerning this matter in the questionnaire was stated simply as: "Is the length of the easement curve based upon the train speed as well as the degree of curve and if so, how?" Answers to this question showed that 25 railroads consider speed as well as degree of curve, while 9 determine the length of the easement from the curvature alone. Five replies were indefinite as to this question or reported varying practices. On three roads the length of the spiral is determined directly from the speed and curvature through the formula $L = K V E$, where L is the length of the spiral curve in feet, K is a constant, V is the velocity of the train in miles per hour and E is the superelevation of the curve in inches. The constant K was given in two cases as 1.0 and in one case as $1\frac{1}{3}$.

On a number of roads the length of the spiral is made directly proportional to the elevation of the circular curve, the rules to this end calling for 40 ft. to 66 ft. of transition curve to each inch of superelevation. For convenience these rules are commonly expressed as $\frac{1}{2}$ in. or $\frac{5}{8}$ in. for each 30 or 33-ft. rail length.

That the length of the spiral has an important bearing on railway location in difficult country is brought out very emphatically in a statement by Mr. Hood of the Southern Pacific which accompanied his reply to the questionnaire. This is as follows:

"The usefulness of the taper depends on the general maximum running speed of the trains in the several localities, and where speed restrictions result in slow speeds, as for instance either up or down steep mountain grades, the taper is not needed to a very great extent, and in such localities a very short taper is justifiable if its use will result in an appreciable saving over the cost of construction required by a longer taper.

"It is evident that when a train is once on the main curve, the taper has no further effect and it is no more appropriate to run too fast, for instance, on a tapered eight-degree curve than on an eight-degree curve that is not tapered. On valley lines, a taper beginning with 30 ft. of a 15-min. curve provides adequate easement for the use of the fastest trains. On a mountain side and similar lines with steep grades and moderate grades, a taper beginning with a 2-deg. 30-min. curve is found to give excellent results, and its use is entirely justified where a flatter (and longer) taper would involve increased cost of construction.

"Too flat a taper and too long a reversing tangent increases the cost of construction in a mountain country with steep transverse slopes, or in a confined river gorge where flood water is dangerous and the mountain sides are steep, to an extent not always fully appreciated. The effect of the taper and reversing tangent in increasing the cost of construction is indicated by the amount that the resulting distance, in a direct line between the centers of the corresponding main curves, is in excess of the sum of the main curve radii, the difference of these distances indicating the additional horizontal distance to be disposed of in excess of that involved in the case of reversed curves without tapers and without reversing tangents between them.

"The greatest effect of this sort results from the use of flatter tapers, indicating that more benefit is to be derived with the same expenditure in construction from the use of longer reversing tangents than from the flatter tapers. A reversing tangent 180-ft. long provides amply for the longest engine and tender now in use, including a suitable length at each end of the reversing tangent for handling the elevation of the track for the first 30 ft. of the taper curve.

"To illustrate this, take the case of two six-degree curves with tapers commencing with 30 ft. of one-degree curve and

with 120 ft. of reversing tangent. These curves will have their centers separated by a distance 21.7 ft. greater than the sum of their radii. Two six-degree curves with tapers commencing with 30 ft. of 30-min. curve and with 120 ft. of reversing tangent will have their centers separated by a distance of 63.1 ft. in excess of the sum of their radii. Thus in the latter case it is necessary to dispose of an additional horizontal distance of 41.4 ft. in excess of that in the first case and this 41.4 ft. might result in prohibitive or at least in extravagant cost of construction. This indicates the need of conservatism in deciding on the financially appropriate taper curve rate."

Spirals Are Inserted During Construction

It is clear from the replies received that the use of spirals has extended over a considerable period of years and that since their adoption the easements are being applied to the alinement at the time of construction in nearly all cases. The work of applying the easement to the lines built previous to the adoption of the easement curve has, of course, been carried out as opportunity afforded or as the increase in the traffic or the importance of the line demanded. Thus, the Canadian Northern reports that these easements are being introduced on old lines at times of re-ballasting, while other roads report that this is done during extensive reconstruction work. The replies with regard to this feature of the questionnaire are summarized as follows: On 32 roads the spirals are introduced at the time of reconstruction; on three they are applied subsequently; on one road they are introduced at the time that the track is laid and being lined; on another they are laid out just before ballasting. One road reports a varied practice.

No discussion of easement curves is complete without some consideration of the means provided for a permanent record of the spiral locations and of the information supplied to track forces for maintaining the alinement and superelevation. It was for this reason that the questionnaire included the question "Are the limiting points of the easement curve defined on the ground by permanent markers and do each carry the data as to the full elevation and rate of run-off?" To this question 12 roads replied that such permanent markers were provided with complete data; 11 stated that markers were provided without any data; 3 reported the use of stakes; while 10 roads replied that no markers were provided; one road reported a variable practice while another stated that the location of the spirals was carefully referenced and recorded.

Chairman Clark Discusses the Rate Question

WASHINGTON, D. C.

CHAIRMAN CLARK of the Interstate Commerce Commission is making it increasingly clear where the Interstate Commerce Commission stands on the question of rate reductions which is so prominent just now. He has stated it in letters to senators who have written to him voicing the complaints of constituents against high rates. He stated it in his speech before the Railway Business Association on March 31, and it was stated in the letter to the heads of the railway traffic committees regarding proposed reductions in grain rates, which the commission's director of traffic wrote under his instructions and which was made public last week. Mr. Clark stated again in a letter to Senator Shortridge of California, dated April 6, that "it is difficult to see how the railroads could be urged to reduce their rates" and that if shippers are experiencing difficulties their plight cannot well be much worse than that of the railroads. It is believed that

with all these expressions it should not be difficult to guess what he told the President at their conference on March 31. Mr. Clark also shows some skepticism as to the merit of numerous complaints that the rates themselves are the principal cause of the trouble. The letter to Senator Shortridge was in reply to one from the senator on behalf of shippers of California fruits and vegetables urging a conference or a hearing at Los Angeles on the subject of freight rates. Chairman Clark said:

The request grows out of the fact that we recently arranged to have our director of traffic hold an informal conference with representatives of the fruit and vegetable industry and of the railroads at Dallas, Texas. The purpose of the hearing was to have a full exchange of ideas, to give the shippers opportunity to present the difficulties which they encounter, and to have the railroad representatives consider carefully whether or not conditions were such as to justify a reduction in the freight rates on these commodities. We sent notices of the hearing to railroads and interested shippers in various sections of the south and southwest, including California. The Los Angeles people requested that a hearing be had at Los Angeles following the conference at Dallas, but it was not practicable to comply with that request.

We have had numerous communications from California interests on this subject, and, as I said over the 'phone, the question is under negotiation between the representatives of the railroads and representatives of the Citrus League. This league, as we understand, represents more than 90 per cent of the citrus shipments. I do not know what conclusions will be reached in the negotiations that are now progressing.

We have no authority to require the railroads to reduce rates except after a full hearing at which the propriety of the reduction is demonstrated. We would be obliged to find that the existing rates are unreasonable.

The freight rates are on a very high level. No one would be more pleased than we if conditions would permit general reductions therein. It is, however, difficult to see how the railroads could be urged to reduce their rates, when, as shown by the official reports, they are as a whole earning scarcely more than their operating expenses and taxes. It is obvious that the present condition can not long continue without bringing widespread bankruptcy to the roads. More than 90 cents of every dollar they earn is spent in the operating cost of earning it. Less than 10 cents of each dollar is left with which to pay taxes, interest and return on investment. Sixty cents out of each dollar earned are paid out in wages, and on some roads this runs as high as 64 cents.

At the time the increased rates were inaugurated in August last it was recognized that some readjustments would be necessary. Many readjustments have been made. In some instances investigation has demonstrated that some reduction in the rates would move a substantial volume of traffic, with some profit, which would not move under the then existing rates. Under those circumstances readjustments have been made and are under consideration. We have tried to be helpful in such negotiations and that was the purpose of the conference at Dallas. That conference, however, does not seem to promise any readjustment of the rates on fruits and vegetables. The railroad representatives have, so far at least, taken the view that the reduction would not increase the volume of movement and that in view of the financial conditions, to which I have referred, the roads cannot afford to reduce the rates.

We had some vigorous representations from interests in Florida that the rates were stifling the movement of fruits and vegetables from Florida; but upon investigation and ascertainment of all the facts it developed that the movement of fruits and vegetables for the period of November 1, 1920, to March 1, 1921, exceeded by several hundred cars the movement during the same period of 1919-1920.

We are in no wise insensible to the difficulties which shippers generally are experiencing, but, as I have said, the plight of the shippers can not well be much worse than that of the railroads. In many instances inquiry into a situation demonstrates that it is not high freight rates that is preventing the sale of goods at the prices that must be paid. We are passing through a period of readjustment following the convulsions of the war, and many hardships exist which are the result of the world-wide economic forces which it is hoped will progressively adjust themselves with steadily improving conditions.

It is not pleasant to have to write in this tone, and I do not want to be understood as pessimistic. I believe that the situation is clearing and will gradually clear, and that readjustment of the operating expenses of the railroads will produce a much brighter outlook and make it possible to effect more readjustments of rates with consequent benefit to commerce and industry generally.

National Agreements Case Decision to Come Soon

Twenty Rules Called Just and Reasonable—Employees Continue Testimony in Support of Rules

A DECISION IN THE controversy between the railroads and certain of their employees regarding perpetuation of the National Agreements has been practically completed by the Labor Board. This decision, offered by a member of the public group, adopts as just and reasonable about 20 principles regarding working conditions of railway employees. The negotiation of these principles into agreements is remanded to the individual carriers and their own employees. This briefly summarizes the action which the Board will take in this dispute within a few days. The effect of this action cannot be foretold at this time, inasmuch as the employees are still engaged in presenting rebuttal evidence to the Board. It is probable, however, that the employees' representatives will fight for their opportunity to complete the presentation and oppose the rendering of a decision until this presentation is ended.

The Week's Developments

Developments during the past week in the hearings before the Railroad Labor Board on the employees' demands for continuation of their national agreements have been colorless. The presentation of testimony on behalf of the employees continued in the form of (1) a rebuttal by B. M. Jewell, president of the Railway Employees Department of the American Federation of Labor and spokesman for the labor organizations; (2) exhibits by W. Jett Lauck, consulting economist for the unions, and (3) the cross examination of Frank McManamy, formerly assistant director, mechanical department, division of operation, United States Railroad Administration. Mr. Jewell's opening statements in rebuttal and the beginning of Mr. McManamy's examination were described in the *Railway Age* of April 8 (page 899). The list of questions submitted by Mr. Jewell to Mr. McManamy as a guide for his testimony in defense of the shop crafts' agreement, took the latter four days to answer due partially to the frequent interrogation of the witness by W. L. Park, a representative of the carriers on the Board.

The questions presented by the labor leaders and upon which Mr. McManamy based his testimony were intended to establish facts: (1) opposing the "charge that the Railroad Administration was ill-advised in negotiating national agreements, also that the director general was coerced by actual physical fear into making the agreement;" (2) opposing the charge that shop crafts' agreement has resulted in a great decrease in the efficiency of the individual employee working under the agreement and in the destruction of the morale of shop forces; (3) opposing the charge that national agreements prevent the carriers from conducting the transportation industry economically; (4) opposing the claim that national agreement rules are impossible of fair interpretation for all parts of the country and that the decisions of adjustment boards have made it possible for employees to extract a maximum of money from the railroads; and (5) opposing the carriers' assertion that the restoration of efficiency in railroad shops is largely dependent upon the restoration of piece work. The outline included approximately 60 questions, all directed at bringing out relevant facts.

Before entering upon his testimony, Mr. McManamy said: "In testifying before this board the director general desires that I make it clear that this is not the testimony of the present railroad administration; it is the testimony of myself, as an individual, based on the experience which I had

with the railroad administration during the period of active federal control."

Mr. McManamy's reply to the first question in general characterized all of his testimony during the four days he was on the witness stand. The question was: "What led the railroad administration to negotiate a national agreement with the shop crafts?" The answer was: "In general the national agreement was negotiated with the shop crafts because it was believed that it would promote efficiency and economy in shop operation, remove much of the unrest which at that time prevailed among the railroad shop employees, reduce the labor turnover at the various shops, prevent the practice on the roads which had favorable agreements and favorable rates sending men—usually some member of a labor organization—to other roads to solicit employees to come to work for them because of the more favorable rates and better working conditions. This I believe was an unnecessary expense and affected the efficiency of shop operation and in a measure stirred up discontent among the employees."

In answering the remaining questions, Mr. McManamy frequently reverted to this statement and stated that the placing in effect of the shop crafts' agreement resulted in accomplishing all of these purposes.

His testimony throughout was in favor of the continuation of the national agreement and supported at every turn the case which the employees' representatives are attempting to build up in support of their demands.

During the intervals of each day when Mr. McManamy was not on the witness stand, Mr. Jewell continued the presentation of his direct rebuttal in support of his demand for continuation of the shop crafts' agreement, taking up first, the scope of this agreement and citing various decisions by Railway Board of Adjustment No. 2, to support his contention that the workers covered by this agreement have not been improperly classified under its rules and the interpretations thereto.

Mr. McManamy's Examination

After Mr. McManamy had completed his response to the questions submitted by the labor leaders he was cross-examined by James M. Sheean, counsel for the Conference Committee of Managers, which is presenting the railroad's case. A large portion of this cross-examination dealt with Mr. McManamy's statements regarding the comparative efficiency and economy obtained under piece work pay as compared with the hourly system of pay. Mr. Sheean by his examination analyzed the import of the data on this subject presented to the Board by Mr. McManamy. The bases of the comparisons were attacked by Mr. Sheean, who maintained that they were not just in that they did not take into consideration a large number of variables.

Mr. Park and Mr. Sheean, in further questioning Mr. McManamy, developed the point that despite Mr. McManamy's assertion that the existence of agreements has tended to alleviate unrest and restrain employees from striking, many strikes occurred during 1919 on roads on which agreements were in effect. In support of this contention, Mr. Sheean submitted a list of roads upon which general or system strikes have taken place, and upon which agreements were in effect at the time of the strike.

Following this, Mr. Sheean established by examination that the committee of four, which acted upon the question of National Agreements, after a disagreement between the com-

mittee representing the regional directors and the employees, was composed of men, none of whom had ever had managerial responsibility and yet who represented the managements in the final negotiation of the National Agreements.

Mr. McManamy was then excused.

On April 12 Mr. Jewell continued his direct rebuttal to the evidence placed before the Board on behalf of the carriers, taking up the Shop Crafts Agreement rule by rule and outlining the employees' stand upon the application of each rule and upon the evidence submitted in opposition to its continuance.

To establish the authenticity of a letter read to the Board by Frank P. Walsh, counsel for the labor organizations on March 22, and declared a fake by representatives of the carriers, Mr. Jewell requested the Board on April 8 to summon five employees of the Pennsylvania who would be familiar with the contents of this letter if it had been written at the time and place indicated. The character of this letter was outlined in the *Railway Age* of March 25 (page 807). The Board has not acted upon this request up to the present time, although it is generally conceded that these witnesses will be called inasmuch as the letter has been submitted to the Board and proof of its authenticity demanded by representatives of the carriers. I. W. Geer, general manager of the Pennsylvania, Southwestern Region, alleged author of the letter, has denied any knowledge of its existence.

Wage Case Docketed

The order of the Board docketing hearings on the request of various carriers for wage reductions, as briefly described in last week's *Railway Age*, is as follows:

Whereas, There are reasonable grounds to believe that a number of other carriers parties to Decision No. 2 are about to file application for decision on disputes as to what shall constitute just and reasonable wages; and

Whereas, In the judgment of the Labor Board, it is desirable that this Board hear at one time and decide in one decision, so far as may be possible, the question as to what may constitute just and reasonable wages for all classes of employees of carriers parties to Decision No. 2 as to whose wages there may be disputes. Therefore be it

Resolved by the United States Railroad Labor Board, That 9.30 a. m., Chicago time, Monday, April 18, 1921, be set as the date of hearing when this Board will hear the representatives of the parties to disputes on the carriers named above and all other disputes filed and docketed prior to that time between carriers and employees of carriers parties to Decision No. 2 if ready for presentation.

Resolved, further, That the carriers will be allowed eight hours and the organization eight hours for oral presentation and argument. The carriers and organizations will arrange for representation accordingly. Evidence to any extent desired by either party may be submitted in writing, furnishing adverse party with copy thereof. All such written evidence must be submitted prior to April 20, 1921.

No action has been taken as yet upon the controversy between the St. Louis Southwestern and its employees, hearings on which were outlined in the *Railway Age* of April 8th (page 903).

"Human Standards and Railroad Policy"

The present industrial situation of paralysis is the result of a strike of organized capital against society, according to an exhibit on "Human Standards and Railroad Policy," submitted to the Board on April 14 by Mr. Lauck.

"Capital, nationally and internationally organized and concentrated," the exhibit declared, "takes the stand that the capital strike shall go on until labor comes to its knees and consents to sweeping reductions of wages and also consents to surrender its right to bargain collectively on a scale co-extensive with the organization of the employers."

The summary of the exhibit stated in part:

"The evidence presented in this exhibit, summarized, has the following purport: It shows that there is a capital com-

bine consisting of the major banks, the railroads and the industries controlling basic materials, and that this combine has and exercises a power over the economic destiny of the United States. It shows that this interrelated capital group deliberately 'deflated the farmers' and then undertook, by precipitating industrial stagnation, to 'deflate labor.' It shows that within the same capitalist group lies the power to adjust or misadjust relative prices in a manner that will stimulate or suppress industrial activity. It points out that this focal capitalist group has deliberately maintained high prices of steel, coal, cement and other basic materials and that the railroads, financed by the same interests, have refused to place the orders for plant maintenance, or even the orders necessary to prevent plant and equipment deterioration. The consequence of the general constrictive policy practiced by every branch of this capital combine has clamped a brake upon all industry and has precipitated the army of unemployment.

"The exhibit surveys the costs of national unemployment and shows that the wastes due to unemployment represent, in terms of products unproduced, an amount of goods and services fully equal to one-half of the total wealth that is produced.

"The exhibit shows that the greater factors in American industry, the railway equipment producers, the railway repair works, the steel interests, the coal, cement and other basic material producers—all are closely bound together by intercapital relations and interlocking directorates, and that the determination of their major policies centers in, and is controlled by a number of men scarcely larger than go to make up the administrative and executive staff of the government of the United States."

"The railway employees in their exhibit make no issue as to the propriety or the possible necessity of a centralized system of economic co-ordination and control in a highly industrialized and interdependent country like the United States," Mr. Lauck said. "The point of the employees' exhibit is its challenge of the misuse which the combine in this instance has made of its power. The employees call attention to the national responsibility which the possession of such power entails and note that this responsibility in the case of the railway industry has been legislatively and judicially recognized and written into the federal laws of the United States, and the employees specifically point out that this responsibility has been and is being unscrupulously evaded.

"The railroads are pleading poverty. The banks are making unprecedented profits and declaring unprecedented dividends and the same applies to steel, coal, railway equipment and similarly situated concerns. The capital combine, in preparing to precipitate unemployment, adopted the policy that the railroads 'should do it first.' Railway improvement programs were deferred; railway maintenance was reduced below minimum legal requirement; a kink was put in the purchasing power of the American people and industry sent 'head on' into stagnation.

"In exhibiting the enormous profits that have been 'plowed under' by the banks and basic industries, and in exposing the fact that the railways have been and are paying over 200 to 300 per cent excess profits to railway auxiliary supply concerns, the employees deny that there is any valid railway poverty necessitating retrenchment at the expense of the status of labor."

The exhibit, a printed document of 150 pages, outlines the opposing views of unemployment as they are interpreted by the employees' organizations, the employees themselves presenting the subject in its purely sociological phases, while the managements are pictured as regarding it purely as a means for the forcible "deflation of labor." The growth of unemployment on the railroads since June, 1920, said to aggregate

300,000 men of which about one-third were employed in railroad shops, is sketched and specific cases of equipment conditions on a number of railroads are cited to substantiate the claim that the curtailments of shop forces during this period were not justified by any reduction in the volume of maintenance work actually awaiting attention. One instance is cited where overtime, following the lay-off of six machinists at Raton, N. M., on the Atchison, Topeka & Santa Fe, is said to have accumulated during January, 1921, to an amount a few hours short of enough to have kept six machinists and four helpers employed during the entire month. Several specific cases are cited on the Norfolk & Western and the Baltimore & Ohio where bad order cars are reported to have been removed by foremen from cars having serious defects and the cars allowed to run in trains.

A large amount of evidence, in the form of copies of official correspondence and letters from railway employees, is presented to show that extensive contracts for repairs to equipment were in effect and in some cases have been extended during this period of reduction of the shop and repair track forces of the railroads. In this respect the New York Central and its freight car repair contracts have been singled out for especially detailed treatment, and correspondence is quoted tending to show that a flow of equipment to meet the requirements of this road's contract has at times been maintained with difficulty.

The development of the Hornell Repair and Construction Company to take over the Erie shops at Hornell, N. Y., the Owen Construction Company to take a contract for maintenance of way work on a portion of the Erie, and the Phoenix Transit Company to take over and operate the road's New York harbor equipment, are cited as further evidence of the beginning of a new policy in which it is alleged the railroads intend to sub-contract as many of their functions as possible in order to remove these operations from the "protection afforded to railroad workers under the Transportation Act by the Railroad Labor Board" and "to utilize the resulting uncertainty of employment to worry the remaining railroad employees into accepting by 'agreement' lower standards of wages and living conditions." The evidence presented, however, shows that so far as the Hornell Repair and Construction Company is concerned, its employees are working under the same conditions and rates of pay and have the same privileges as similar employees of the railroad.

The recent establishment or extensive development of a number of other contract repair shops was referred to in this connection, some of which are as follows:

The Buffalo Steel Car Corporation has been built up to handle the repair work for all roads running into Buffalo, N. Y. These include the Buffalo, Rochester & Pittsburgh, the Delaware, Lackawanna & Western, the Lehigh Valley, the Michigan Central, the New York, Chicago & St. Louis, the Pennsylvania, the Wabash, and the New York Central.

The Manitowac Shipbuilding Company has been taken over by a new corporation which will operate it for the railroads. New buildings have been erected and tracks laid to handle both locomotive and car repair work. The new plant for railroad work probably represents \$300,000 investment.

The Boston banking firm of Hornblower & Weeks is promoting a deal whereby the weak Laconia Car Company will lease and operate under contract, the shops of the Bangor & Aroostook.

The East St. Louis Locomotive and Car Company, capitalized at about \$5,000,000 has been created and has built a large plant in East St. Louis, Ill., to be given over exclusively to the repairing of locomotives and freight cars, serving the 24 railroads that converge in St. Louis. It is expected to start with 500 men and to increase its force to 2,000.

Financial publications continue to talk of the fact that Baldwin Locomotive will take over the big shops of the Pennsylvania and handle the repairs of that system under contract. It is also rumored that the same company will take over the Baltimore & Ohio shops.

The evidence presented in an attempt to show that the

railroads are using unemployment to subjugate their men is in the form of statements of several railroad employees, of a more or less hearsay character, to the general effect that the roads on which they were employed were "going to have piece work back if they had to lay off every man." These statements were supplemented with newspaper comments on the labor situation and rumors which have appeared in the public press.

In support of the assertion that the railroads could have kept all shopmen employed, the exhibit presents a large volume of data to substantiate the claim that "the total excess cost of equipment repairs made under contract by outside concerns has been sufficient to pay all the shop employees laid off throughout the country for full time work," the following statement is made: "Broadly speaking, the cost of locomotive repair work when done under contract by large equipment concerns costs the roads on an average four times as much as it would cost the roads to do similar work in their own shops. In other words, repair work which would under ordinary circumstances when done at the present time in railroad shops, cost from \$4,000 to \$5,000, tends when under contract with equipment concerns, to cost between \$19,000 and \$20,000."

A table is presented in which are shown by railroads a total of 617 locomotives repaired in outside shops, for 413 of which, what are said to be the actual contract prices are given. These are compared with the cost of similar work done in railroad shops which are said to be Railroad Administration figures.

The railroads are said to have contracted with outside concerns for the repair of at least 100,000 freight cars and on the basis of somewhat similar evidence the statement is made that "these outside repairs are costing the railroads all the way from \$700 to \$1,700 per car, and that this cost would average very nearly double the cost of similar work if performed by railroad mechanics in the railroad shops."

The second part of the exhibit is replete with charts showing the connection through directorships of the railroads, railroad equipment companies, coal companies and banks with the constant inference that these connections indicate a control of the basic industries by a financial group headed by J. P. Morgan & Co., New York. The "deflation of labor" referred to in the summary of the exhibit is attributed to this control.

Throughout this portion of the exhibit references are made to the *Railway Age* and other trade publications, in many cases complete editorials and articles being reproduced as evidence in support of the employees' contentions that this combine has created unemployment and stagnation in industry as part of a gigantic plan.

It will be noted that this evidence is exactly that which has already been ruled out by the Board on the grounds of irrelevancy. Threats that nevertheless this material would be presented have been frequent during the course of the hearings, the employees' representatives deviating from their plans only in presenting the evidence in the form of an exhibit instead of by cross examination.

The exhibit abstracted in the New York Times of April 4 and later in the *Railway Age* of April 8 (page 903) has not been presented to the Board so far but it is expected that this material, dealing with "the inadequacies of management," will be offered as evidence early next week.

THE TICKET SCALPING evil has been brought to the attention of the United States Treasury Department by the Railway Ticket Protective Bureau and internal revenue collectors have been notified to impose the provisions of the Revenue Act of 1918 strictly upon those engaged in the business. The department has directed internal revenue collectors to secure the names and addresses of ticket scalpers and brokers from the bureau and to collect the regular 8 per cent tax on all amounts paid.

Hearing on Great Northern-Northern Pacific Joint Bonds

WASHINGTON, D. C.

NO OPPOSITION DEVELOPED at the hearing before the Interstate Commerce Commission at Washington on April 11 on the application of the Great Northern and the Northern Pacific for authority to issue \$230,000,000 of joint 15-year, 6½ per cent convertible gold bonds, \$33,000,000 of Northern Pacific 6 per cent bonds and \$33,000,000 of Great Northern 7 per cent bonds, which with the stock of the Chicago, Burlington & Quincy owned by the two roads is to be pledged as collateral for the joint bond issue. The new issue is to refund the \$215,000,000 of joint 4 per cent bonds secured by the Burlington stock without the recent increase of \$60,000,000 which came due on July 1. In addition to the witnesses for the railroad companies, Ralph Budd, president of Great Northern, and Howard Elliott, chairman of the Northern Pacific, a number of bankers were called to testify regarding details of the proposed bond issue, the reasons for adopting this form of financing and the probable terms of sale. C. W. Bunn, general counsel of the Northern Pacific, said that no contracts for the sale of the bonds had yet been made and none would be until the application had been approved by the commission. The commission would also be asked to approve the terms under which it would be proposed to make sales.

George B. Whitney of J. P. Morgan & Co. said that the railroads, if the market for railroad bonds does not get worse, can probably realize from 90 to 91½ on the sale of the joint bonds, which would make the cost approximately 7.45 per cent. This would realize about \$210,000,000 and it would be necessary for the railroads to provide the additional amount in some other way. He thought they could probably be sold to the public at 96½ per cent. He was asked a number of questions as to why it would be necessary to allow 5 per cent for commissions and selling expenses and said that the purchasing syndicate would probably charge from ½ to 1½ per cent commission, while 3½ to 4½ per cent would be required by the distributors. He said that practically every bond dealer of the country would be called upon to assist in the distribution and he had a list of over 700. He said that even if the average sale of the bonds is \$5,000 it would be necessary to call on 46,000 people and perhaps several calls would be required to effect the sales. He also described some of the expenses incident to handling such a large bond issue, which represents the largest piece of corporate financing in the history of the railroads. He said that about \$54,000,000 of the joint bonds are held by insurance companies and trustees that are prohibited by law from buying bonds secured only by stock as collateral, but that these could convert the bonds at once into individual issues of the Great Northern or Northern Pacific. He said that it had been estimated that about \$60,000,000 of the bonds could be exchanged for the old bonds, but that this now appeared to be an overestimate. He said the plan of making the bonds convertible would increase their attractiveness to certain classes of buyers and the plan also provides for gradually releasing the Burlington stock pledged as collateral so as to divide it between the roads instead of continuing the joint holding. While no definite agreement had been made, he said that J. P. Morgan & Co. and the First National Bank of New York might contract with the railroad companies to purchase the bonds and simultaneously contract for the sale of the bonds to the distributing syndicate. Commissioner McChord asked whether the short term refunding issue, say for two years, at 7 per cent, would not temporarily tide the refunding over into a period of easier money. Mr. Whitney said the question was entirely hypothetical. If such a thing could be done, it might be wise, but he doubted very much

whether it could be done for only two years at seven per cent.

Mr. Whitney was followed by E. B. Sweezy, vice-president, First National Bank; H. L. Stuart, of Halsey, Stuart & Co., of Chicago, and John E. Oldham, of Merrill, Oldham & Co., of Boston, who said that the selling price of 96½ per cent was as high as could possibly be charged and who considered the commission of 5 per cent fair. Commissioner Potter asked the bankers to discuss the question as to whether it is to the interest of bankers to increase the rate of interest or to try to keep it down. They all testified that the bankers do not fix the rate and that it is to their interest that the rate be as low as possible, but all placed the greatest importance on fixing the terms of the issue in such a way that it would be sure to be successful.

Senator Cummins Asks Railroad Investigation

WASHINGTON, D. C.

SENATOR CUMMINS on April 12 introduced in the Senate his proposed resolution providing for a general investigation by the Senate committee on interstate commerce into the railroad situation with particular reference to the increase in expense since the return of the railroads to private operation and the best means of bringing about a condition that will warrant a reduction in rates. The text of the resolution, which was referred to the committee on contingent expenses of the Senate, also indicates that the investigation is likely to bring out some interesting comparisons of the efficiency of management under the Railroad Administration and under private operation. Senator Cummins has stated that he expects to begin hearings about May 1 and that he proposes to call first upon the railroads who have been preparing a large amount of statistical information on the subject in advance, at his request. Testimony will also be offered on behalf of the National Association of Owners of Railroad Securities, the labor organizations and the shippers, and the Interstate Commerce Commission will also be called upon for information and the views of the commissioners. It is also considered probable that various bills which are expected to be introduced by individual Senators bearing on the railroad question will be referred to the committee in connection with its investigation. The resolution introduced by Senator Cummins provides as follows:

That the Committee on Interstate Commerce is hereby authorized and directed to inquire into and report to the Senate as speedily as practicable upon the following matters, to wit:

First. The operating revenues and expenses of the railroads of the country which under the law make reports to the Interstate Commerce Commission, comparing these revenues and expenses with like revenues and expenses (including the period of Federal Control) since 1912.

Second. The reasons which led to the extraordinary cost of maintenance and operation from March 1, 1920, to March 1, 1921.

Third. The reasons which induced the diminished volume of traffic in the latter part of the year 1920 and first two months of 1921, and in that connection the influence of the increased freight and passenger rates prevailing during that period.

Fourth. The efficiency or inefficiency of railroad management during Federal control and during the year beginning March 1, 1920, and the efficiency or inefficiency of labor employed by the management during the same periods.

Fifth. The best means of bringing about a condition that will warrant the Interstate Commerce Commission in reducing freight and passenger rates.

The Committee is authorized to act under this resolution either as a whole or through any sub-committee appointed for the purpose; to subpoena witnesses, administer oaths, send for persons and papers; and to employ counsel, experts and stenographers. The expense incurred shall be paid from the contingent fund of the Senate, upon vouchers approved by the chairman of the committee.

Recent Slump in Traffic Worst in History

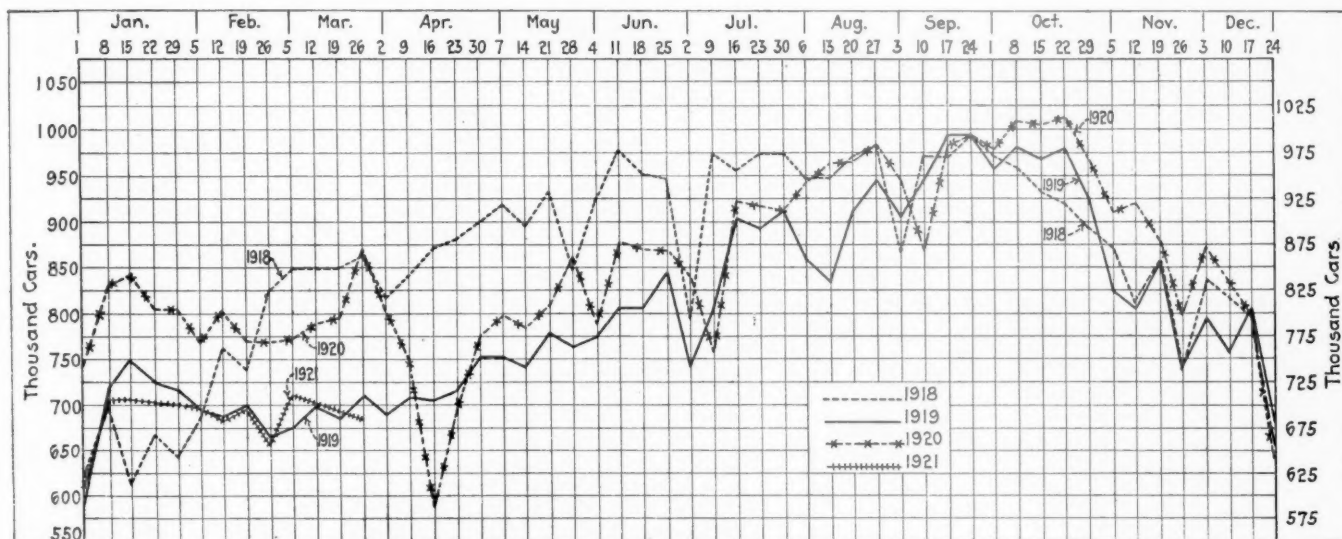
Drop in Freight Business, October to February, 40 Per Cent—Car Loading Since January First, 15 Per Cent Less Than for 1920

THE SLUMP in the volume of railroad freight traffic which has occurred since the peak of last fall, is probably the worst that has been experienced in the recent history of the railroads for which comparable statistics are available. It is rather difficult to show whether it is any worse than that which followed the so-called bankers' panic of October, 1907, and it closely parallels the experience following the termination of the war in 1918, but it is now apparent that the reduction in railroad freight business has fallen from a higher point in 1920 to a lower point in 1921 than was the case in 1918-1919.

The number of idle freight cars for the week of March 31, which was 495,904, was the largest ever recorded, and the percentage of the total cars owned, 21, was greater than the surplus of 451,739 in March, 1919, which was 19.77 per cent, or the surplus of May, 1908, which was 413,605,

for January, 1921, (estimated) were 26 per cent less than those for August, 1920, which was the peak month in that respect. From August, 1918, to January, 1919, the drop was also 26 per cent. From August, 1918, to February, 1919, there was a drop of 37 per cent. For February, however, the revenues were about $4\frac{1}{2}$ per cent less than in 1920.

The ton miles for February are not yet available, but will show even lower figures than January. The car loading figures, however, are available to April 2. From the peak of October, 1920, to February, 1921, the drop in monthly car loading was 45 per cent as compared with 41 per cent from July, 1918, to February, 1919. To January, 1921, the drop was 31 per cent as compared with a drop of 25 per cent to January, 1919. The decrease from the peak week of 1920 to the low point of 1921 was 33 per cent, the same as the corresponding drop in 1918-1919. From Oc-



Car Loading from January, 1918 to Date

or 19.78 per cent. The total earnings and the freight earnings for January, 1921, were greater than they had ever been in any previous January, but that was largely because the rates were higher than ever before. The railroads in the fall of 1920 handled a larger traffic than ever before, but in January, even with the increase in rates, the operating revenues were only 5 per cent larger than in 1920, the freight earnings were about 4 per cent larger and the ton miles were about 15 per cent less, while the number of cars loaded with revenue freight was 16 per cent less. From January 1 to April 2, 1921, the number of cars loaded has been 9,012,795, as compared with 10,628,808 in 1920 and 9,158,457 in 1919.

As compared with the peak of 1920, October, the February earnings show a drop of 36 per cent as compared with a drop of 30 per cent from August, 1918, to February, 1919. From August, 1918, to February, 1919, the drop was 30 per cent, but the comparable figures for 1921 are not yet available. It is known, however, that February this year will probably make a worse showing than January. The freight revenues dropped 33 per cent from October, 1920, to January, 1921, as compared with a drop of 20 per cent from October, 1918, to January, 1919. From October, 1918, to February, 1920, the decrease was 33 per cent. The ton miles

tober, 1907, to January, 1908, there was a decrease in the gross revenues of 30 per cent but figures for ton miles and car loads for that period are not available. There was also a marked decrease in the volume of traffic between October, 1919, and April, 1920, when the switchmen's strike occurred, but the reduction was less marked than that of 1921 and the period of decrease was of shorter duration. Following the depression of 1908 a large number of railroads went into receiverships but during 1919 and 1920 the effects of the slump in traffic were borne by the government because the railroads were then under a guaranty at the expense of the taxpayers while at the present time the railroads are operating on their own resources.

Fluctuations in Railroad Traffic

A study of the statistics of railroad earnings and traffic for the last few years reveals some remarkable fluctuations. There are wide fluctuations each year from fall to spring, usually from October to February, but in some years the variation has been much more pronounced than in others and the months which show the widest variation are not always the same. February is likely to be the low month for the year, partly because it has only 28 or 29 days, and it

includes a holiday on Washington's birthday, while October has 31 days. In a year of sustained heavy traffic August is sometimes the heaviest month, partly because it includes one more day than September or November. Sometimes the January results, when equated on a daily basis, are lower than those for February. In 1920 April made a worse showing than February, because of the switchmen's strike.

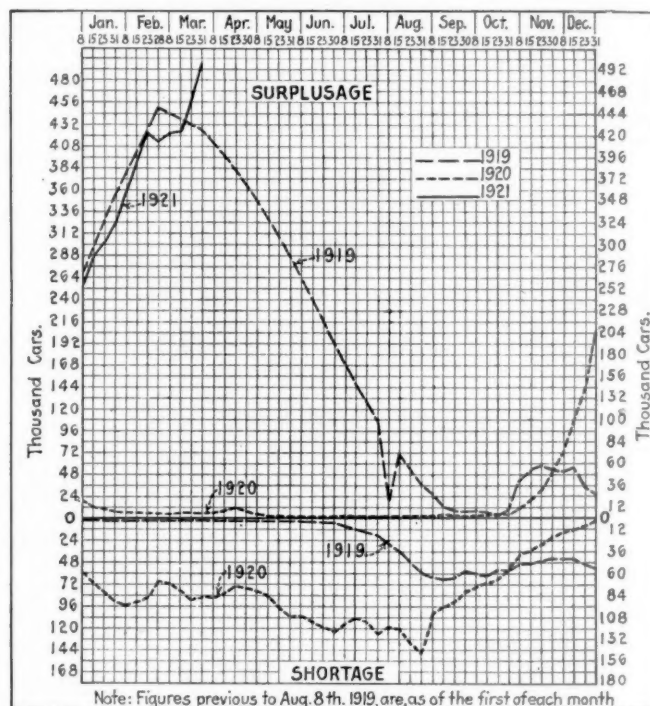
While in many quarters it is the fashion just now to attribute the present depression largely to the increase in freight rates put in effect on August 26, 1920, analysis of previous years shows that reductions in traffic almost as pronounced have occurred without such a cause. There was no particular change in rates in 1907 and the market depression in 1918-1919 came a long time after the increases in rates which were made in June, 1918. The analysis also indicates that pronounced periods of depression in the past have been followed by upward swings which have invariably reached higher levels and that in 1919 and 1920 the new high records were established in the same year that the low records were made.

There was a big increase in railway traffic in 1906 and 1907, accompanied by a large car shortage and followed by a sharp falling off in traffic after the panic. Statistics showing the volume of traffic by months are not available for periods earlier than 1916 but a fairly accurate index of the fluctuations by months is afforded by the total earnings of the railroads. After having reached a peak for that period in October, 1907, when the gross earnings of the railroads were \$250,000,000, there was a slump to \$161,000,000 for February, a drop of 35 per cent, although when the years 1907 and 1908 are compared as a whole the ton miles of freight fell off only from 236,000,000,000 to 218,000,000,000, a decrease of 7 per cent. Whereas in November, 1907, there was a shortage of 90,000 cars, this had given place by May, 1908, to a surplus of 413,000 cars.

Variations in Earnings

There was a general upward trend of traffic until the fall of 1913 when the gross earnings reached \$290,000,000 in October, but there was another marked period of depression in the early part of 1909 when the car surplus in January reached 333,000, although this was followed by a shortage of about 36,000 cars in November. In 1910 and 1911 there was a net surplus of cars, reaching 143,000 cars in the summer of 1910, and 196,000 in April, 1911, but there were also some shortages in both years, as well as in 1912 and 1913, and throughout most of 1914 and 1915 there were large surpluses, attaining a maximum of 242,000 in June, 1914, and 327,000 in April, 1915. In February, 1914, the gross earnings of the railroads had fallen to \$203,000,000, a decrease of 30 per cent as compared with October, 1913, but by September they had again increased to \$266,000,000. In February, 1915, they fell to \$205,000,000, a drop of 23 per cent, and in October, 1915, they were \$303,000,000. In January, 1916, the earnings were \$261,000,000, a reduction of 14 per cent from October, and in October, 1916, there was another gain to \$338,000,000 followed by a drop of 21 per cent to \$265,000,000 in February. In October, 1917, there was another peak, \$382,000,000, followed by a drop of 25 per cent to \$285,000,000 in January, 1918. There was a general advance in freight rates in the East in 1917 but it was in effect before October, so the comparison is not affected. In 1918 the largest monthly earnings were in August when they reached \$504,000,000, having been swelled by the general increases in rates put into effect by Director General McAdoo in June. Following the signing of the armistice in November, 1918, there was a sharp reduction in traffic, although it had begun to fall off earlier, and for February, 1919, the earnings were only \$351,000,000, a reduction of 30 per cent as compared with August. Car shortage had begun

to develop in 1915 and to increase in 1916. In November, 1916, about the time the country began to feel the effects of the war orders, there was a shortage of 140,000 cars and throughout 1917 there was a shortage, which reached its maximum with 164,446 in May. The car shortage continued through 1918 although it was steadily reduced after having reached about 160,000 in March, and in March, 1919, it had given place to a larger surplus than had ever before been recorded, 451,739. By the end of 1919 traffic had again increased until the earnings under the same rates which had been in effect during the latter part of 1918, in October reached \$509,000,000, and there was a shortage of about 60,000 cars during the fall months. In April, 1920, the earnings fell to \$401,000,000, a drop of 21 per cent, although traffic had been unusually heavy preceding the switchmen's strike which culminated in that month, and throughout most of the balance of the year it was of record-breaking propor-



Car Surpluses and Shortages

tions. In January the earnings were \$509,000,000. In October, 1920, under the influence of the heavy traffic and also the new increase in rates made effective on August 26, the earnings were \$642,000,000 but by January, 1921, they had fallen to \$470,000,000, a drop of 27 per cent, and by February to \$406,000,000, a drop of 36 per cent. Throughout the greater part of 1920 there was a car shortage beginning with about 54,000 in January and rising to 147,000 in September, but by November a slight surplus had developed which steadily increased until the week of March 31.

Freight Revenues

Gross earnings, of course, do not exactly reflect the changes in the volume of traffic because they include the reflection of the previous month's business, and the total earnings including passenger revenues often make a showing slightly different than the freight earnings. While the widest fluctuation in total operating revenues between 1918 and 1919 was from August to February, a drop of 30 per cent, the greatest fluctuation in freight revenues was from \$364,000,000 in October to \$242,000,000 in February, a drop of 33 per cent. While the total revenues dropped 21 per cent from October, 1919, to April, 1920, the freight revenues fell 18 per cent

from \$368,000,000 in October, 1919, to \$299,000,000 in February, 1920, but in April they were only \$268,000,000, a drop of 27 per cent. From October, 1920, to January, 1921, while the total revenues show a decrease of only 27 per cent, the freight revenues show a decrease of 34½ per cent, and to February, 1921, the drop was 40 per cent.

Ton Miles

For the period since 1917 statistics are available for the ton miles of freight by months. From May, 1917, to January, 1918, the drop in ton miles was 28 per cent; from August, 1918, to January, 1919, it was 26 per cent and from October to February it was 37 per cent. From October, 1919, to April, 1920, it was 30 per cent, while from August, 1920, to January, 1921, the drop was 26 per cent. The reduction from October to February, for which the figures are not yet available, will, of course, be greater.

Car Loading

Another measure of the falling off of freight traffic for recent years is afforded by the weekly and monthly reports of cars loaded with revenue freight compiled by the Car Service Division of the American Railway Association. In

2,090,612, (including those of Mexican and Canadian roads). In March, 1919, the total was 2,284,716 (excluding Mexican and Canadian) and in March, 1921, it was about 2,343,000.

During the last 16 years there have been net car shortages in some parts of nine years, 1906, 1907, 1912, 1913, 1916, 1917, 1918, 1919 and 1920, while in seven of the years there have been considerable surpluses. While in three years, 1908, 1919 and 1921, the surplus cars have reached approximately 20 per cent of the total cars owned, the maximum shortage, 164,446 cars in May, 1917, represented the equivalent of only 6.7 per cent of the 2,454,000 cars owned at that time. During and following the great car shortage of 1906 the railroads placed large orders for additional cars. According to the records of the *Railway Age*, 341,315 freight cars were ordered in 1905, and 310,315 in 1906. In 1907, 151,711 were ordered and in 1908 only 62,669. At the end of 1906 the railroads owned about 1,840,000 freight cars and the number shows a fairly steady increase to about 2,400,000 at the end of 1914. In 1909, 189,360 cars were ordered; in 1910, 141,024 and in 1911 only 133,117. In 1912 there was a car shortage, which amounted to about 70,000 cars in November and in 1912 the railroads ordered 234,758 cars. In 1913 the shortage continued to some extent and in that

1920-1921		1919-1920		1918-1919	
Total revenues:		October	\$509,000,000	August	\$504,000,000
October	\$642,000,000	April	401,000,000	January	397,000,000
January	470,000,000		21%	February	351,000,000
February	406,000,000				Jan. 21%, Feb. 30%
Decrease:		October	368,000,000	October	365,000,000
January	27%	April	268,000,000	January	278,000,000
February	36%		27%	February	242,000,000
Freight revenues:					Jan. 20%, Feb. 33%
October	481,000,000	October	40,343,000,000	August	40,776,000,000
January	323,000,000	April	28,208,000,000	January	30,178,000,000
February	284,000,000		30%	February	25,474,000,000
Decrease:					Jan. 26%, Feb. 37%
January	34½%	October	4,824,375	July	4,674,038
February	40%	April	2,837,330	January	3,504,352
Ton miles:			41%	February	2,747,363
August	42,656,000,000				Jan. 25%, Feb. 41%
January	31,154,000,000	Last week September....	995,901	Last week September....	991,980
Decrease	26%	Third week April.....	584,089	First week March.....	675,704
Cars loaded:			41%		32%
October	4,975,477				
January	3,418,257				
February	2,732,352				
Decrease	Jan. 31%, Feb. 45%				
Cars loaded:					
Week October 18.....	1,010,961				
Week February 12.....	681,627				
Decrease	32%				

1918 the peak was reached in the last week of September when 991,980 cars were loaded. Omitting weeks in which holidays occurred the greatest reduction from that peak reached in the following year was shown for the first week in March, 1919, when the loading was 675,704 cars, a decrease of 316,704 cars, or 32 per cent. In 1920 the peak week was that ending October 18, when 1,010,961 cars were loaded, a new record, and omitting the weeks in which holidays occurred, the lowest figure since recorded was that for the week of February 12, when the loading was 681,627, a reduction of 329,334, or also 32 per cent. For the week of April 2 the loading was 666,642.

The biggest freight month in railroad history was August, 1920, when the ton miles aggregated 42,656,000,000; the net ton miles per mile of road per day were 5,995; the total earnings were \$555,000,000, and the freight earnings \$369,000,000. The lowest month in recent years, taking into consideration the number of days, was January, 1918, when the ton miles were only 27,619,000,000.

Car Surpluses and Shortages and Car Purchases

The fact that the car surplus of March 31 is a higher percentage of the total than previous record-breaking surpluses is in spite of the increase in the number of cars owned. In 1906 the total was 1,840,005, and in May, 1908, it was

year the railroads ordered 146,732 cars, but throughout 1914 and 1915 there was a large surplus of cars and in 1914 only 80,264 cars were ordered and in 1915 only 109,792. During 1915 and 1916 the number of cars owned was reduced but after the appearance of the shortage which began in the latter part of 1915 the orders were increased and in 1916 aggregated 170,054, but in 1917, although the maximum shortage ever reached occurred in that year, 164,446, in May, only 79,367 cars were ordered. The number of cars owned apparently reached its maximum about April, 1918, when the number owned was 2,547,000, including Mexican and Canadian, which account for over 200,000 cars. Since June, 1918, the car statistics of the American Railway Association do not include Mexican and Canadian roads, but for January, 1921, the total owned is reported as 2,343,217. There were 123,770 cars ordered in 1918 but only 25,899 in 1919 and 84,207 in 1920.

The comparison between the peaks and depressions of the past three years is shown in the accompanying table.

TWELVE HUNDRED quart bottles of whisky were found in a car of hides, received by the Maine Central from Canada, when the car was examined after its arrival at Calais, Me., recently, and three men were arrested on charges of smuggling.

Freight Car Loading

WASHINGTON, D. C.

THE NUMBER OF CARS loaded with revenue freight again declined during the week ending April 2, according to the weekly report of the Car Service Division of the American Railway Association. The total was 666,642, as compared with 858,827 for the corresponding week of 1920 and 688,567 for 1919. This is the lowest figure reported for a week this year, with the exception of the week of the Washington's Birthday holiday, and represents the fourth successive decline since the increase during the first week of March. Although the holiday on Mitchell's day, April 1, in the coal mines, accounts for part of the decrease, it does not account for the drop in the loading of other commodities. The loading for the last five weeks is about the same as it was for the preceding five weeks, but the total loading since January 1, 9,012,795, is about 15 per cent less than for the corresponding period of 1920, when it was 10,682,808 and is also less than for 1919 when it was 9,158,457.

The principal decrease was in the number of cars loaded with coal, the total for the week being only 109,284 cars or 12,905 cars below the total for the previous week. It was more than 59,000 below the same week in 1920.

With the exception of grain and grain products, which showed a slight increase, decreases were reported in the loading of all other classes of freight as compared with the previous week. Next to coal, the greatest loss was reported in the loading of merchandise and miscellaneous freight which fell off 4,000 cars. This is the first decrease in the loading of this class of freight since January 1 last. A reduction of

2,600 cars was also reported in the loading of forest products, while ore dropped 970 cars. Compared by districts, the number of cars loaded during the week in each region was under that for the preceding week except in the central and southwestern districts. Decreases, however, were shown in all districts as compared with the corresponding week in 1920.

The freight car surplus for the week ending March 31, according to the weekly report of the Car Service Division of the American Railway Association, was 495,904 cars, the largest ever recorded in the history of American railroads and an increase of 36,493 over the total on March 23.

It is also an increase of 82,000 within a month, due almost entirely to the falling off in coal shipments. Of the total surplus slightly more than half, or 255,055, consisted of coal cars, compared with 172,850 on March 1. A steady decline in the cars loaded with coal has been reported each week, the total for the week ended on April 2 being 109,284. The report also shows an increase in the number of surplus box cars, the total on March 31 being 171,119 or 6,900 more than on March 23. It is, however, about 2,400 below the total on March 1.

Increases in the surplus for all classes of cars, as compared with March 23, were shown in all districts except the Pocahontas and Southern. The former broke even while the latter showed a decrease of 3,000. In the Eastern district there was an increase of 13,000; Allegheny, 5,000; Northwestern, 6,000; Central Western, 11,000, and South Western, 4,000 cars. The percentage of freight cars on home lines on April 1 was 70.6, as compared with 21.9 on March 1, 1920, when the government relinquished the railroads. This is the highest percentage attained during the war period.

FOR WEEK ENDED SATURDAY, MARCH 26, 1921

Districts:	Year	Grain and grain products	Live stock	Coal	Coke	Forest products	Ore	Merchandise L.C.L.	Miscellaneous	Total revenue freight loaded		Received from connections	
										This year 1921	Corresponding year 1920	This year 1921	Corresponding year 1920
Eastern	1921	5,162	2,550	35,264	757	5,945	704	52,900	61,001	164,283	.....	181,061	.....
	1920	5,705	3,182	56,824	4,475	7,502	4,244	38,969	106,464	.....	227,365	.....	266,432
Allegheny	1921	2,421	2,847	37,868	2,746	2,555	1,447	40,735	48,150	138,769	.....	92,994	.....
	1920	2,433	3,276	58,175	6,016	3,931	4,900	46,210	75,344	.....	200,285	.....	142,222
Pocahontas	1921	155	67	13,554	42	1,530	18	2,975	5,421	23,762	.....	13,132	.....
	1920	144	71	22,721	806	1,921	269	158	9,833	.....	35,923	.....	18,604
Southern	1921	2,922	1,589	16,893	552	14,050	681	39,814	39,984	116,785	.....	61,699	.....
	1920	3,324	2,149	24,738	343	17,333	2,756	26,132	56,376	.....	133,151	.....	82,295
Northwestern	1921	9,432	6,401	3,850	763	15,554	1,094	27,836	27,463	92,393	.....	42,303	.....
	1920	9,884	8,171	9,370	1,285	22,195	1,859	22,739	42,192	.....	117,695	.....	64,384
Central Western	1921	8,680	8,896	11,652	145	3,517	2,068	30,086	36,872	95,916	.....	45,992	.....
	1920	8,196	11,195	21,990	529	6,331	2,984	24,068	45,496	.....	120,789	.....	69,324
Southwestern	1921	4,188	1,689	3,108	174	6,365	468	16,682	23,270	55,944	.....	42,454	.....
	1920	4,309	2,299	7,156	161	8,215	668	16,481	25,889	.....	65,178	.....	53,186
Total, all roads	1921	32,960	24,339	122,189	5,179	49,516	6,480	211,028	236,161	687,852	.....	479,635	.....
	1920	33,995	30,343	200,974	13,615	67,428	17,680	174,757	361,594	.....	900,386	.....	696,447
Increase compared	1920	40,665	28,456	142,928	.....	56,459	14,078	.....	430,689	.....	.....	.....	557,736
Decrease compared	1920	1,035	6,004	78,785	8,436	17,912	11,200	.....	125,433	212,534	.....	216,812	.....
Increase compared	1919	.....	.....	.....	5,179	.....	.....	211,028	.....	.....	.....	.....	.....
Decrease compared	1919	7,705	4,117	20,739	.....	6,943	7,598	.....	194,528	25,423	.....	78,101	.....

FOR WEEK ENDED SATURDAY, APRIL 2, 1921.

Districts:	Year	Grain and grain products	Live stock	Coal	Coke	Forest products	Ore	Merchandise L.C.L.	Miscellaneous	Total revenue freight loaded		Received from connections	
										This year 1921	Corresponding year 1920	This year 1921	Corresponding year 1920
Eastern	1921	5,357	2,299	27,930	964	5,864	367	54,623	62,351	159,755	.....	173,383	.....
	1920	5,533	2,846	43,198	3,853	7,490	3,366	38,176	106,193	.....	210,655	.....	258,225
Allegheny	1921	2,294	2,455	32,028	2,514	2,370	1,233	41,032	46,661	130,587	.....	85,583	.....
	1920	2,506	2,858	50,382	8,243	3,712	5,865	43,461	74,892	.....	191,919	.....	135,093
Pocahontas	1921	145	63	12,799	57	1,398	36	2,513	5,656	22,667	.....	12,616	.....
	1920	70	42	21,086	597	1,623	222	155	7,149	.....	30,944	.....	15,660
Southern	1921	3,086	1,719	16,414	492	12,850	782	38,054	37,851	111,248	.....	59,917	.....
	1920	3,535	2,208	21,713	141	17,705	2,325	26,734	56,632	.....	130,993	.....	79,410
Northwestern	1921	8,376	6,530	4,293	566	14,561	802	27,499	24,619	87,246	.....	40,084	.....
	1920	8,028	7,623	7,068	1,390	19,834	1,975	22,347	42,034	.....	110,871	.....	59,113
Central Western	1921	9,550	8,605	12,194	143	3,569	1,804	30,936	31,974	98,769	.....	46,599	.....
	1920	8,028	10,006	19,135	479	5,834	2,995	24,942	48,418	.....	119,837	.....	69,116
Southwestern	1921	4,546	1,913	3,626	126	6,299	484	16,593	22,783	56,370	.....	40,979	.....
	1920	3,644	2,587	6,094	173	7,985	668	16,666	25,791	.....	63,608	.....	53,255
Total, all roads	1921	33,354	23,584	109,284	4,862	46,911	5,508	211,244	231,895	666,642	.....	459,161	.....
	1920	31,916	28,170	168,676	14,876	64,183	17,416	172,481	361,109	.....	858,827	.....	669,872
Increase compared	1920	1,438	.....	.....	.....	54,270	13,223	.....	419,100	.....	.....	.....	518,098
Decrease compared	1920	4,586	59,392	10,614	17,272	11,908	.....	38,763	.....	.....	.....	.....	.....
Increase compared	1919	.....	.....	.....	4,862	.....	.....	211,244	.....	192,185	.....	210,711	.....
Decrease compared	1919	4,142	4,830	26,780	.....	7,359	7,715	.....	187,205	21,925	.....	58,937	.....

L.C.L. merchandise loading figures for 1921 and 1920 are not comparable as some roads are not able to separate their L.C.L. freight and miscellaneous of 1920. Add merchandise and miscellaneous columns to get a fair comparison.

March 26, 1921	32,960	24,339	122,189	5,179	49,516	6,480	211,028	236,161	687,852	900,386	713,275	479,635	696,447	557,736
March 19, 1921	36,038	26,423	126,081	6,122	50,065	6,048	208,816	232,114	691,707	855,060	699,720	490,938	652,300	515,212
March 12, 1921	37,896	27,847	136,097	7,103	52,484	6,864	205,334	228,443	702,068	819,329	701,266	494,588	614,091	522,988
March 5, 1921	41,936	28,257	143,436	7,828	52,216	7,315	201,068	230,826	712,882	811,106	675,270	495,599	629,417	500,104

General News Department

The American Association of Engineers will hold its seventh annual convention at the LaFayette Hotel, Buffalo, N. Y., on May 9, 10 and 11.

Committee Reports to be represented at the meeting of the Signal Section, A. R. A., at Chicago, on June 6, 7 and 8, will be mailed to members on May 16.

W. O. Thompson, secretary of the Traveling Engineers' Association, has changed his headquarters from New York to 1177 East 98th street, Cleveland, Ohio.

Minnesota and New York have appealed to the United States Supreme Court from lower court decisions upholding the orders of the Interstate Commerce Commission increasing intrastate freight and passenger rates to correspond to the advances made in interstate rates.

The Southeastern Express Company will begin operations on May 1 over all the lines of the Southern. The general offices of the company are located at Atlanta, Ga. J. B. Hockaday is president of the company and G. H. Kerr is traffic manager.

The car records of the yards of the Pennsylvania Railroad in and around Pittsburgh, Pa., are now kept in a single consolidated office, in charge of W. T. Wolff. Yards included in this arrangement are Pitcairn, Wilkinsburg, Forty-third street, Etna, Island avenue, Scully and Conway.

Six persons were killed and 30 injured when the Royal Palm Limited on the Southern was derailed near New River, Tenn., on April 6 while en route from Jacksonville, Fla., to Chicago. Three day coaches were overturned and three sleeping cars derailed. The accident is thought to have been caused by spreading rails.

The American Society for Testing Materials will hold its twenty-fourth annual meeting at the New Monterey Hotel, Asbury Park, N. J., on June 20 to 24, inclusive. Monday, June 20, will be devoted to committee meetings, and the first session of the annual meeting will be held on Tuesday morning, June 21.

The Underwriters' Laboratories, and their service to safety engineering, will be the subject for discussion at the meeting of the American Society of Safety Engineers, at 29 West 39th street, New York City, on Friday evening, April 22. The principal papers will be by Dana Pierce, vice-president of the Underwriters' Laboratories, and George B. Muldaur, general agent.

The Chamber of Commerce of the United States has announced the appointment of a committee of five, with five alternates, to co-operate with Secretary Hoover in working out a plan for closer relationship between business and the Department of Commerce. Included among the alternates are Howard Elliott, chairman of the Northern Pacific, and A. L. Humphrey, president of the Westinghouse Air Brake Company.

The four brotherhoods of railway train service employees have joined forces with the American Federation of Labor "to defeat legislation inimical to the rights of wage-workers," according to a statement given out by the Federation of Labor at Washington after a conference of labor leaders at which the legislative situation in Congress was discussed. A committee was appointed to consider labor legislation and to report at a meeting of the joint conference later.

Twelve hundred and fifty calls in 24 hours is the record recently made on one train dispatchers' telephone circuit, as reported by W. P. Cline, superintendent of telegraph of the Atlantic Coast Line. This is equal to over fifty calls an hour, and

illustrates in a striking way one of the advantages of the telephone for sending train orders. The statement was made in a brief address before the last meeting of the Southern & Southwestern Railway Club, at Atlanta, on the use of the telephone in train dispatching. Mr. Cline is satisfied that by the operations, with marked benefits to the general conduct of train movement on his division, but also does his work with less nervous strain and less fatigue, which, of course, makes for increased efficiency.

Master Boiler Makers' Convention Deferred

The executive board of the Master Boiler Makers' Association has voted to defer the annual meeting which was scheduled to have been held at St. Louis, Mo., May 23 to 26.

A Correction

In the article describing the special run made with a Pacific type engine on Erie train No. 3, which appeared on page 708 of the issue of March 18, an error occurred. The leaving time at Jersey City was given as 12:18 p. m., though it should have been 2:18 p. m. The mistake is evident from the context as the leaving time did not check with the time of arrival and the elapsed time.

More Than a Trillion Units of Traffic

At noon on Wednesday, April 13, every locomotive and shop whistle on the entire Pennsylvania Railroad System was blown continuously for thirty seconds, to signalize the seventy-fifth birthday of the Pennsylvania Railroad. The company was started in 1846 by an act of the Legislature of the Commonwealth of Pennsylvania. American flags were displayed throughout the day, Wednesday, from all of the road's station, shops and buildings. The accounting department estimates that in its 75 years of existence, the Pennsylvania system has rendered public service equivalent to the carrying of one ton of freight 950 billions of miles and one passenger 115 billions of miles.

Hearings on Cost of Locomotive Repairs

The Interstate Commerce Commission has announced that public hearings will be held on April 18 at Philadelphia and on May 9 at New York with reference to the cost of locomotive repairs made in outside shops, as to which charges were filed with the commission by the International Association of Machinists and other organizations of shop employees that the railroads were paying excessive prices as compared with the cost if the work had been done in their own shops. The hearings are to be held by Examiner Barclay. That at Philadelphia is to be in reference to the locomotive equipment of the Pennsylvania and affiliated lines and that at New York in reference to the locomotives of the New York Central. The commission some time ago announced a formal proceeding of investigation under the title "construction and repair of railroad equipment" and it has been making an informal investigation and obtaining information by the questionnaire method.

The Most Important Problem

The Fidelity & Deposit Company of Maryland has recently published a general survey of national business conditions, with an analysis by David F. Houston, formerly Secretary of the Treasury. The information is based on a questionnaire sent to a thousand selected representatives of the company in all parts of the country. In answer to the question, "What problem has the greatest bearing on business prosperity?" the reply from New England, Middle Atlantic, East North Central, West North Central and Pacific States was, first, taxation, and second, railroads.

From the South Atlantic, East South Central and West South Central the answer was taxation first and peace question second. From the Mountain states the answer was taxation first and tariff second. In reply to the question, "Are general transportation conditions good?" the answer from all sections was in the affirmative.

Business-Getting on the B. & O.

H. O. Hartzell, manager of the commercial development department of the Baltimore & Ohio, is holding meetings at prominent points on the lines of that company to interest employees of all classes in the importance of soliciting freight and passengers. It is desired that every employee be on the watch to do a good turn for the road, in this direction, whenever opportunity offers. The Veterans' Association of the road, acting on a suggestion made by President Daniel Willard some months since, has been active in this work; and now Vice-President Archibald Fries has initiated the present campaign, with rallies at the principal division points. All of the officers of the company are requested to attend the meetings and employees in all departments are called upon to post themselves. The first meeting was at Pittsburgh, Pa., on April 11. About twenty meetings will be held, the last one in the present schedule being set for Fairmont, W. Va., on April 29.

Accident Bulletin No. 77

The Interstate Commerce Commission has issued quarterly accident bulletin No. 77, dated February 28, containing statistics of railroad accidents occurring in the United States in the three months ending with September, 1920. During this quarter, 24 passengers, 126 employees and 26 other persons were killed in train accidents, and 1,246 passengers, 840 employees and 67 other persons were injured. In train service accidents 49 passengers, 524 employees and 1,295 other persons were killed, and 1,159 passengers, 12,273 employees and 2,362 other persons were injured; making a total for both classes of 2,044 persons killed and 17,947 injured. Adding to these, the casualties in non-train accidents and there is a total for the quarter of 2,168 persons killed and 47,003 persons injured.

The total number of train accidents in the quarter was 10,292, including 3,258 collisions and 5,922 derailments; and the total damage to cars, engines and roadway by these accidents was \$9,982,870.

Colonel Shaughnessey Appointed Second Assistant Postmaster General

E. H. Shaughnessey, assistant director of the Division of Transportation of the American Petroleum Institute, formerly trainmaster of the Chicago & North Western, and later an officer of the transportation corps of the A. E. F. in France, has been appointed second assistant postmaster general, in charge of the railway mail service, an office which Postmaster General Hays had originally offered to R. H. Aishton, formerly president of the Chicago & North Western, and now president of the American Railway Association. Mr. Shaughnessey entered the service of the Chicago & Northwestern in July, 1899, as a telegrapher. In 1917 he was trainmaster, and was given leave of absence to enter the military service. He assisted in the organization of the 13th Engineers, and later assumed command of Company E as first lieutenant and later as captain. After some service in the Verdun sector in France he was assigned to duty with the transportation corps, and was promoted to colonel.

Steam Heated Cars for Perishable Freight

A system of heating cars while transporting highly perishable food stuffs has recently been developed by Alfred L. Moorshead, industrial commissioner of the Erie Railroad. Instead of providing heaters operated with oil or charcoal in each car as is the usual practice, the new type of equipment derives its heat from the locomotive. A steam duct leads from the locomotive under each car with a connection to the interior. A thermostat is installed to prevent the car from becoming overheated and auto-

matically shuts off the steam when the interior reaches a predetermined temperature, varying with the commodity in the car.

The elimination of oil and charcoal heaters has numerous advantages, including the elimination of fire risk and damage to the lading resulting from the gases produced by combustion. It is stated that the initial cost of installation of the new type of equipment is low and that it is more effective than the ordinary type of heaters. Preliminary tests, in which the Department of Agriculture participated, have been conducted to determine the results that can be obtained. In one trip the outside temperature varied from 28 deg. F. to minus 20 deg. F., while the air inside the car was never below 52 deg. F. and never above 66 deg. F.

Revenues and Expenses for February

The railroads of the United States suffered a deficit in February of \$7,344,669, while 106 out of 200 reporting to the Interstate Commerce Commission failed to earn their expenses and taxes. In January 109 out of 202 roads failed to make expenses and taxes. Of the 106 roads in February, 46 were in the Eastern, 16 in the Southern and 44 in the Western districts. The carriers fell short about \$64,000,000 of earning the amount which it was estimated they should earn under the increased rates fixed by the Interstate Commerce Commission in accordance with the Transportation act. Total operating revenues for February were \$405,783,000, or a decrease of 4½ per cent, as compared with February, 1920, while total operating expenses were \$385,443,000, a decrease of 7½ per cent.

During the six months since the increased rates were made effective, the net railway operating income of the carriers has totaled \$218,311,800, which would be at the annual rate of return of 2½ per cent on their tentative valuation. On the basis of an annual return of 6 per cent it was estimated they would earn during that period \$531,686,000. During the first four months of the increased rates, that is, from September 1 to January 1, their net operating income was at the annual rate of 3.3 per cent.

While the freight earnings show a decrease of 5.1 per cent as compared with last February, the passenger earnings increased 7.2 per cent.

Cash Fare Penalty

The Pennsylvania Railroad, to encourage the purchase of tickets and reduce the burden of collecting cash fares, which has become especially serious on suburban trains, proposes, beginning May 15, to assess a penalty of five cents for each fare paid on trains, on its lines east of Pittsburgh, Erie and Buffalo; and the five cents will not be refunded. Tariffs covering the new regulations have been filed with the regulative commissions. The tendency of passengers to pay cash fares, rather than take the trifling trouble of purchasing a ticket in advance, has increased greatly. In a single year more than four million passengers on the Pennsylvania System east of Pittsburgh paid cash fares in cases in which tickets could readily have been bought. The new rule applies only when and where ticket office facilities are available.

In some states west of Pennsylvania measures have already been taken by this company, with the approval of the regulative commissions, to discourage carelessness by imposing and retaining cash penalties. The new charge is not to be imposed with any desire to produce revenue, but solely for the purpose of affording an incentive to avoid the payment of cash fares when tickets may be purchased in advance. The company hopes that the five-cent penalty will prove adequate to accomplish the result sought, but if it does not, a higher charge may be imposed.

Graft in Chicago Railroad Construction

A committee of the state legislature of Illinois, which is inquiring into building conditions at Chicago, is said to have uncovered evidence, at the hearing on April 9, of a conspiracy which netted certain union labor interests in Chicago thousands of dollars in connection with the construction of the Union station. Although the hearings were held behind closed doors, it was reported that at various times it was necessary to pay fees in order to use material purchased from manufacturers outside of Chicago and to employ workmen not directly under the jurisdiction of the local unions. One witness is reported to have told of numerous strikes in

connection with the construction of the station and to have stated that a five weeks' tieup of excavation work was caused because the union hoisting engineer was not under the jurisdiction of the local union, although a member of a union affiliated with the American Federation of Labor. Another witness is said to have told the committee of the payment of an "insurance fee" of \$10,000 for the settlement of a strike on a roundhouse construction job on the Chicago & Alton in order that the work might proceed. According to the testimony, the use of material and labor obtained outside of Chicago was dictated by Chicago interests, who exacted a fee which, in the case of the material, increased the cost from 50 to 200 per cent.

Railroads to Collect from War Department

The office of the quartermaster general of the War Department has recently made arrangements with the finance officer of the department for expediting the payment of a large number of outstanding bills in favor of the railroads for past services in passenger and freight movement, as well as of current bills, which is expected to result in the payment of \$10,000,000 to \$15,000,000 to the roads this month. The government has owed the railroads some \$20,000,000 and owing to the reductions of force being made by the government for purposes of economy, the finance office has until very recently been getting further behind each day. Col. Hayes, chief of the rail transportation service, quartermaster general's department, has been interesting himself in the matter and has notified the railroads that arrangements have now been perfected both for the payment of a large proportion of the old accounts and the prompt payment of future accounts.

January Revenues and Expenses

The Interstate Commerce Commission has issued the following compilation of the operating revenues and expenses of 201 Class I roads for January:

	United States	
	1921	1920
Average number of miles operated.....	235,528.20	234,504.37
Revenues:		
Freight	\$324,825,450	\$311,565,615
Passenger	105,295,673	91,874,146
Mail	8,225,256	60,528,728
Express	7,443,572	13,899,174
All other transportation.....	13,469,135	10,946,507
Incidental	10,367,335	11,538,294
Joint facility—Cr.....	707,198	713,970
Joint facility—Dr.....	185,495	227,231
Railway operating revenues.....	470,148,124	500,839,203
Expenses:		
Maintenance of way and structures.....	61,318,932	57,891,205
Maintenance of equipment.....	124,376,773	117,755,937
Traffic	7,357,685	4,944,891
Transportation	231,440,606	218,913,350
Miscellaneous operations	4,496,550	4,361,883
General	15,285,224	12,887,473
Transportation for investment—Cr.....	575,108	336,545
Railway operating expenses.....	443,700,662	416,418,194
Net revenue from railway operations.....	26,447,462	84,421,009
Railway tax accruals.....	22,833,061	20,413,074
Uncollectible railway revenues.....	83,247	117,630
Railway operating income.....	3,531,154	63,890,305
Equipment rents (Dr. bal.).....	3,227,569	2,429,765
Joint facility rent (Dr. bal.).....	1,261,984	1,820,842
Net railway operating income.....	958,399	59,639,698
Ratio of operating expenses to operating revenues	94.37	83.14

Air Brake Meeting Cancelled

Because of the present depressed railway and business conditions now existing throughout the country, the executive committee of the Air Brake Association recently met in New York and decided to cancel the 29th Annual Convention regularly scheduled to be held in Chicago, May 3, 4, 5 and 6. A business meeting of the Executive Committee, however, will be held in the Hotel Sherman, beginning May 3 and lasting not more than two days, at which reports of the various committees will be received, and other business in furtherance of safety and economy in railroad air brake practice will be attended to. This meeting while primarily intended for the members of the executive committee and the chairmen and members of the committees reporting, will be made an open one to which all members who can attend without inconvenience to themselves and their railroads will be welcomed.

Two regular committee reports will be received on Recommended Practice and Air Consumption of Locomotive Auxiliary Devices. Also, papers prepared by the several air brake clubs of the country will be tendered as follows: Manhattan Air Brake Club, "Empty and Load Brake"; Northwest Air Brake Club, "Triple Valve Repairs"; Dixie Air Brake Club, "Hand Brake Efficiency"; Central Air Brake Club, "Installation and Maintenance of the Vent Valve"; St. Louis Air Brake Club, "Backing Trains into Terminals"; Montreal Air Brake Club, "Steam Heating of Passenger Trains"; Pittsburgh Air Brake Club, "Modification of Present Terminal Test to Insure an Effective Grade Brake as well as an Operative Brake."

Regular notices advising members of this change will be mailed from the secretary's office in a day or two.

Locomotive Boiler Code Adopted by A. S. M. E.

An important step in engineering standardization was taken at the Boston meeting of the council of the American Society of Mechanical Engineers, when it adopted in its final form that portion of the A. S. M. E. Boiler Code known as the Locomotive Boiler Code. This code contains the rules for the construction of locomotive boilers which are not subject to federal inspection and control.

The necessity for such an addition to the Boiler Code arose from the fact that, while the boilers of locomotives operated on railways engaged in inter-state service are covered by the construction and inspection rules of the Interstate Commerce Commission, there was found to be a vast mileage of industrial and short-line railroads in operation in the various states, which by virtue of their location, are not subject to the interstate requirements.

As a result of calls for a code to cover the construction of boilers of this class, the Sub-committee on Railway Locomotive Boilers was appointed in 1916. This committee consisted of F. H. Clark, chairman; F. J. Cole, chief construction engineer of the American Locomotive Company; A. L. Humphrey, vice-president and general manager of the Westinghouse Air Brake Company; S. F. Jeter, chief engineer of the Hartford Steam Boiler Inspection & Insurance Company; William F. Kiesel, Jr., mechanical engineer of the Pennsylvania, and H. H. Vaughan, vice-president of the Dominion Copper Products Company, Montreal. The work of this sub-committee was interrupted somewhat by the war, but its preliminary report was submitted to the Boiler Code Committee in April, 1919.

The preliminary report was printed and distributed at the Spring Meeting in Detroit where it was accepted by the meeting. It was thereupon published in the August issue of Mechanical Engineering. The sub-committee has been co-ordinating the points of view of all who would be affected by such a code and the final result approved by the main committee and the council is now ready for use. H. V. Wille, assistant to the vice-president of the Baldwin Locomotive Works, and Kenneth Rushton, chief mechanical engineer of the Baldwin Locomotive Works, were brought into the committee and with Mr. Cole and James Partington, estimating engineer of the American Locomotive Company, appointed in place of Mr. Humphrey, resigned, represented the locomotive manufacturers.

Constructive assistance was given by the Mechanical Division of the American Railway Association through its representatives, A. W. Gibbs, mechanical engineer of the Pennsylvania; W. I. Cantley, of the Lehigh Valley; and N. A. Ferrier, of the New York Central. A. G. Pack, chief inspector of the Bureau of Locomotive Inspection, Interstate Commerce Commission, has expressed great interest in the code and with his staff has been in frequent attendance at meetings of the sub-committee.

During the past two years Mr. Clark, the original chairman of the committee, has been in China as Technical Adviser to the Ministry of Communications at Peking. Mr. Vaughan has carried on the work of the committee as acting chairman.

The code, itself, follows the general form of the Code for Stationary Boilers. The materials to be used and methods of construction of the various braced and stayed surfaces are very carefully specified. Attention is given to the desire of the locomotive builders to maintain the lowest possible weight consistent with strength. As compared with stationary boilers with a safety factor of five the allowable factor for locomotive shells is four. Requirements in the use of safety valves and their method of test are rigid as are the hydrostatic tests specified.

REVENUES AND EXPENSES OF RAILWAYS

MONTH OF FEBRUARY AND TWO MONTHS OF CALENDAR YEAR 1921

Name of road.	Average mileage operated during period.	Operating revenues			Operating expenses			Net from railway operation.	Operating ratio.	Net after rentals.	Increase (or decr.) comp. with last year.
		Freight.	Passenger.	Total.	Way and structures.	Maintenance of equipment.	Traffic.				
		(inc. misc.)	(inc. misc.)	(inc. misc.)	(inc. misc.)	(inc. misc.)	(inc. misc.)				
Alabama & Vicksburg.....Feb.	141	\$153,663	\$54,303	\$207,966	\$51,921	\$80,004	\$7,882	\$114,797	\$12,168	\$268,872	\$13,388
2 mos.....Feb.	141	435,110	153,776	588,886	151,799	215,776	16,433	338,346	23,389	577,731	56,236
Vicksburg, Shreveport & Pacific.....Feb.	171	233,684	80,643	314,327	86,179	127,240	9,783	228,547	27,328	345,875	28,465
2 mos.....Feb.	171	492,165	173,945	666,110	108,464	181,931	19,635	476,645	27,328	694,373	56,541
Ann Arbor.....Feb.	293	231,304	45,318	276,622	45,318	65,707	8,650	231,304	16,217	297,476	34,715
2 mos.....Feb.	293	621,470	98,786	720,256	116,143	179,233	17,925	604,313	14,444	718,757	58,223
Atchison, Topeka & Santa Fe.....Feb.	8,828	8,937,363	3,965,518	12,902,881	2,042,235	4,530,034	280,294	10,860,646	739,352	11,599,998	1,213,275
2 mos.....Feb.	8,828	18,432,722	8,715,653	27,148,375	4,402,450	9,530,034	546,711	22,745,924	1,789,833	24,535,757	2,435,923
Gulf, Colorado & Santa Fe.....Feb.	1,907	1,698,888	338,164	2,037,052	469,646	624,240	44,128	1,587,406	69,240	2,017,878	221,373
2 mos.....Feb.	1,907	3,637,155	798,848	4,436,003	924,836	1,263,557	87,537	3,548,466	135,343	3,683,809	360,292
Panhandle & Santa Fe.....Feb.	857	488,380	115,815	604,195	120,156	335,997	7,242	480,939	25,747	506,686	53,827
2 mos.....Feb.	857	993,550	258,858	1,252,408	292,906	586,698	14,696	960,502	48,203	1,008,705	100,719
Atlanta & West Point.....Feb.	63	99,200	65,833	165,033	184,426	25,771	7,864	138,557	11,454	176,642	33,222
2 mos.....Feb.	63	192,515	127,491	319,006	389,744	50,121	16,011	263,733	22,810	316,543	69,000
Western of Alabama.....Feb.	133	101,632	55,693	157,325	173,376	26,892	8,024	126,444	10,339	176,783	1,004
2 mos.....Feb.	133	198,956	155,723	354,679	388,486	59,141	15,560	300,125	20,195	370,320	5,561
Atlanta, Birmingham & Atlantic.....Feb.	639	201,086	53,568	254,654	98,473	136,723	24,450	206,181	20,798	276,979	10,159
2 mos.....Feb.	639	473,764	126,102	600,866	191,716	202,385	48,678	412,148	38,429	450,577	30,143
Atlantic Coast Line.....Feb.	4,889	3,994,206	1,991,803	5,986,009	898,675	1,206,912	107,227	5,087,332	139,848	5,226,656	844,822
2 mos.....Feb.	4,889	7,865,958	4,113,669	11,979,627	1,812,034	2,553,493	221,234	10,167,623	287,337	10,454,960	1,014,659
Charleston & Western Carolina.....Feb.	342	194,458	43,353	237,811	64,597	68,458	6,642	170,214	7,519	237,733	66,919
2 mos.....Feb.	342	383,566	93,061	476,627	127,279	133,443	14,266	349,358	14,791	464,149	130,375
Baltimore & Ohio.....Feb.	5,184	11,107,544	2,200,137	13,307,681	1,300,098	3,649,244	271,172	11,997,483	14,961	13,247,444	1,705,487
2 mos.....Feb.	5,184	25,372,151	4,839,314	30,211,465	2,994,057	8,119,863	589,999	27,217,408	1,103,948	28,321,356	3,027,330
Baltimore & Ohio Chicago Term.....Feb.	50	.....	181,615	181,615	29,800	41,090	1,473	151,515	10,217	161,732	29,709
2 mos.....Feb.	50	.....	389,744	389,744	50,121	76,784	3,614	313,023	30,558	343,581	54,846
Staten Island Rapid Transit.....Feb.	23	81,807	82,068	163,875	37,067	41,616	1,656	126,808	12,776	139,584	56,808
2 mos.....Feb.	23	164,396	166,363	330,759	73,851	74,756	3,328	286,908	25,956	312,864	57,723
Pangor & Aroostook.....Feb.	658	610,595	173,350	783,945	129,856	167,547	4,875	654,089	24,142	778,231	82,242
2 mos.....Feb.	658	1,207,839	363,500	1,571,339	274,030	345,633	8,122	1,227,209	44,262	1,271,471	142,398
Bessemer & Lake Erie.....Feb.	225	787,547	41,242	828,789	129,283	183,873	17,728	699,506	13,283	812,789	106,698
2 mos.....Feb.	225	1,725,429	89,679	1,815,108	241,211	336,523	32,758	1,473,897	60,570	1,534,467	121,114
Bingham & Garfield.....Feb.	35	18,233	549	18,782	20,574	4,876	1,207	17,577	5,018	22,595	36,585
2 mos.....Feb.	35	35,987	1,872	37,859	26,089	10,830	3,801	31,058	9,205	40,263	7,341
Boston & Maine.....Feb.	2,300	3,552,191	1,728,923	5,281,114	1,347,637	1,626,503	73,184	3,933,576	251,396	4,184,972	372,828
2 mos.....Feb.	2,300	7,285,767	3,622,712	10,908,479	2,543,937	3,227,272	132,441	8,364,541	563,521	8,928,062	1,064,460
Buffalo & Susquehanna R. R. Corp., Feb.	252	200,790	72,300	273,090	33,510	109,553	3,224	239,580	14,033	253,613	26,072
2 mos.....Feb.	252	417,017	15,953	432,970	75,219	226,675	6,494	357,462	20,286	377,748	84,043
Buffalo, Rochester & Pittsburgh.....Feb.	389	512,095	149,500	661,595	119,838	344,980	16,838	541,757	43,647	585,404	43,671
2 mos.....Feb.	389	1,085,154	322,782	1,407,936	286,064	725,711	36,562	1,121,400	43,647	1,165,047	106,634
Canadian Pacific, Lires in Maine.....Feb.	233	241,884	52,838	294,722	33,184	47,326	3,495	261,538	3,820	265,358	37,877
2 mos.....Feb.	233	539,673	120,763	660,436	66,519	103,469	7,290	593,917	8,033	601,950	76,872
Carolina, Clinchfield & Ohio.....Feb.	291	456,653	39,288	495,941	99,274	156,857	22,992	396,667	20,649	417,316	57,310
2 mos.....Feb.	291	1,053,782	88,090	1,141,872	195,366	336,546	47,219	946,323	43,909	1,090,232	141,187
Central of Georgia.....Feb.	1,913	1,136,767	494,435	1,631,202	300,730	387,892	59,475	1,330,417	75,103	1,405,520	156,480
2 mos.....Feb.	1,913	2,191,551	1,057,202	3,248,753	616,408	789,949	120,085	2,532,344	156,959	2,689,303	292,569
Central of New Jersey.....Feb.	685	3,001,048	638,012	3,639,060	358,230	888,367	35,497	3,280,823	107,488	3,388,311	322,948
2 mos.....Feb.	685	6,291,903	1,328,731	7,620,634	753,380	2,251,843	66,947	6,867,254	240,268	7,107,522	1,960,379
Central Vermont.....Feb.	413	316,384	103,764	420,148	65,327	123,636	9,493	354,651	20,528	375,179	182,105
2 mos.....Feb.	413	645,588	214,571	860,159	131,378	281,544	16,438	628,720	33,088	661,808	320,493
Chesapeake & Ohio.....Feb.	2,542	4,411,156	857,707	5,268,863	862,994	1,749,281	62,483	4,405,869	164,028	4,570,897	550,664
2 mos.....Feb.	2,542	9,853,739	1,898,469	11,752,208	1,734,369	3,867,441	133,265	9,917,843	332,778	10,250,621	1,763,894
Chicago & Alton.....Feb.	1,050	1,535,678	516,537	2,052,215	262,235	709,387	11,556	1,789,980	69,278	1,859,258	198,235
2 mos.....Feb.	1,050	3,371,582	1,121,944	4,493,526	543,012	1,471,297	104,789	3,950,514	136,278	4,086,792	240,233
Chicago & Eastern Illinois.....Feb.	1,130	1,483,543	426,648	1,910,191	230,664	878,512	34,425	1,679,576	70,470	1,750,046	235,880
2 mos.....Feb.	1,130	3,386,544	926,754	4,313,298	514,791	1,804,311	71,759	3,801,507	145,331	3,946,838	432,939
Chicago & North Western.....Feb.	8,402	6,853,601	2,868,926	9,722,527	1,110,623	2,944,008	155,072	8,611,904	366,952	8,978,856	490,853
2 mos.....Feb.	8,402	14,460,217	5,956,345	20,416,562	2,482,217	6,522,063	333,687	17,934,445	767,678	18,702,123	1,492,853
Chicago, Burlington & Quincy.....Feb.	9,389	8,657,783	2,474,590	11,132,373	852,158	2,725,222	168,868	10,280,115	394,396	10,674,511	570,364
2 mos.....Feb.	9,389	18,223,101	5,325,482	23,548,583	2,188,579	5,649,274	364,589	21,359,304	1,316,652	22,675,956	2,826,282
Chicago Great Western.....Feb.	1,496	1,289,818	401,807	1,691,625	164,996	468,346	68,811	1,526,629	63,875	1,590,504	162,132
2 mos.....Feb.	1,496	2,757,555	822,437	3,579,992	365,019	1,002,866	140,263	3,214,126	133,601	3,347,727	357,570
Chicago, Indianapolis & Louisville.....Feb.	654	767,517	300,109	1,067,626	107,171	367,514	32,479	960,453	98,665	1,059,118	182,841
2 mos.....Feb.	654	1,620,667	507,356	2,128,023	215,043	637,134	64,831	1,912,890	106,163	2,019,053	204,199
Chicago Junction.....Feb.	12	372,645	59,675	432,320	59,675	49,058	212	372,645	70,430	443,075	117,209
2 mos.....Feb.	12	711,595	119,734	831,329	119,734	97,390	439	711,330	23,958	835,288	152,542
Chicago, Milwaukee & St. Paul.....Feb.	10,606	2,056,290	10,152,244	12,208,534	875,226	2,983,243	171,265	11,333,289	377,411	12,710,700	2,665,759
2 mos.....Feb.	10,606	4,127,807	21,739,901	25,867,708	2,082,851	6,567,995	333,112	23,784,716	1,255,134	25,039,850	3,105,431
Chicago, Peoria & St. Louis.....Feb.	247	117,597	26,237	143,834	17,685	52,614	4,596	126,242	11,234	137,476	40,406
2 mos.....Feb.	247	263,757	56,388	320,145	46,847	124,784	10,028	273,660	23,760	300,424	81,148

REVENUES AND EXPENSES OF RAILWAYS

MONTH OF FEBRUARY AND TWO MONTHS OF CALENDAR YEAR 1921—CONTINUED

Name of road.	Average mileage operated during period.	Operating revenues			Operating expenses			Operating ratio.	Net from railway operation.	Operating income (or loss).	Net after rentals.	Increase (or decrease) comp. with last year.
		Freight.	Passenger.	Total.	Maintenance of way and structures.	Equipment.	Traffic.					
		(inc. misc.)	(inc. misc.)	(inc. misc.)	(inc. misc.)	(inc. misc.)	(inc. misc.)					
Chicago, Rock Island & Pacific..... Feb. 7,662		\$6,511,894	\$2,251,518	\$8,763,412	\$1,179,227	\$2,034,654	\$174,911	80.15	\$1,301,079	\$829,698	\$492,152	\$90,376
Chicago, Rock Island & Pacific..... 2 mos. 7,662		13,538,583	4,482,036	18,020,619	2,398,464	4,069,310	352,738	80.29	2,692,534	1,659,386	844,304	173,596
Chicago, Rock Island & Gulf..... Feb. 461		858,218	255,341	1,113,559	177,563	203,533	26,491	86.34	96,105	59,735	30,140	47,162
Chicago, Rock Island & Gulf..... 2 mos. 461		1,822,708	559,352	2,382,060	355,117	607,066	52,982	86.34	191,205	118,727	62,478	27,300
Chicago, St. Paul, Minn. & Omaha..... Feb. 1,749		3,028,222	1,188,279	4,216,501	591,831	1,180,970	164,365	80.15	1,035,086	235,902	301,697	444,724
Chicago, St. Paul, Minn. & Omaha..... 2 mos. 1,749		6,056,444	2,376,558	8,433,002	1,183,662	2,361,940	328,726	80.15	2,070,172	471,804	603,394	888,318
Chic., Terre Haute & Southeastern..... Feb. 374		326,251	26,626	352,877	58,184	169,079	5,897	111.89	4,048	21,211	16,819	1,046,982
Chic., Terre Haute & Southeastern..... 2 mos. 374		652,502	53,252	705,754	116,368	338,158	11,794	111.89	8,096	42,422	33,716	2,093,864
Cincinnati, Indianapolis & Western..... Feb. 321		184,816	52,369	237,185	33,007	81,289	14,377	120.85	51,217	66,576	68,954	9,634
Cincinnati, Indianapolis & Western..... 2 mos. 321		369,632	104,738	474,370	66,014	162,578	28,754	120.85	102,434	133,152	137,908	19,268
Colorado & Southern..... Feb. 1,099		1,840,764	377,957	2,218,721	211,478	663,663	23,306	79.02	497,754	339,706	434,394	224,767
Colorado & Southern..... 2 mos. 1,099		3,681,528	755,914	4,437,442	422,956	1,327,326	46,612	79.02	995,508	679,412	868,788	449,534
Fl. Worth & Denver City..... Feb. 454		575,815	194,607	770,422	76,882	162,653	10,661	77.63	178,783	146,924	175,873	183,918
Fl. Worth & Denver City..... 2 mos. 454		1,151,630	389,214	1,540,844	153,764	325,306	21,322	77.63	357,566	293,848	351,747	367,836
Wichita Valley..... Feb. 235		1,284,966	438,669	1,723,635	170,911	401,438	23,149	78.99	346,182	282,388	315,757	110,841
Wichita Valley..... 2 mos. 235		2,569,932	877,338	3,447,270	341,822	802,876	46,298	78.99	692,364	564,776	631,514	221,682
Columbus & Greenville..... Feb. 278		107,669	28,799	136,468	45,985	20,705	3,781	108.94	12,970	26,220	41,295	15,096
Columbus & Greenville..... 2 mos. 278		215,338	57,598	272,936	91,970	41,410	7,562	108.94	25,940	52,440	82,590	30,192
Delaware & Hudson..... Feb. 880		3,122,368	275,595	3,397,963	454,435	1,123,913	42,041	93.35	13,897	63,603	58,684	407,816
Delaware & Hudson..... 2 mos. 880		6,244,736	551,190	6,795,926	908,870	2,247,826	84,082	93.35	27,794	127,206	117,368	815,632
Delaware, Lackawanna & Western..... Feb. 997		4,599,371	1,031,841	5,631,212	656,367	1,636,461	103,723	83.16	421,280	41,098	89,080	226,251
Delaware, Lackawanna & Western..... 2 mos. 997		9,198,742	2,063,682	11,262,424	1,312,734	3,272,922	207,446	83.16	842,560	82,196	178,160	452,502
Denver & Rio Grande..... Feb. 2,585		1,808,866	454,877	2,263,743	254,239	853,825	37,445	91.75	223,180	73,100	143,719	434,679
Denver & Rio Grande..... 2 mos. 2,585		3,617,732	909,754	4,527,486	508,478	1,707,650	74,890	91.75	446,360	146,200	287,539	869,358
Denver & Salt Lake..... Feb. 255		140,711	17,742	158,453	41,364	74,616	940	128.68	48,070	56,077	51,664	34,308
Denver & Salt Lake..... 2 mos. 255		281,422	35,484	316,906	82,728	149,232	1,880	128.68	96,140	112,154	103,323	68,616
Detroit & Mackinac..... Feb. 374		86,622	25,431	112,053	27,597	36,363	3,421	126.81	25,208	34,431	28,696	10,762
Detroit & Mackinac..... 2 mos. 374		173,244	50,862	224,106	55,194	72,726	6,842	126.81	50,416	68,862	57,392	21,558
Detroit & Toledo Shore Line..... Feb. 61		174,048	62,784	236,832	48,304	90,824	5,894	75.62	43,700	33,700	7,490	63,126
Detroit & Toledo Shore Line..... 2 mos. 61		348,096	125,568	473,664	96,608	181,648	11,788	75.62	87,400	67,400	14,980	126,252
Detroit, Toledo & Ironton..... Feb. 454		163,897	14,848	178,745	22,318	55,990	6,703	60.95	13,449	134,449	81,731	109,263
Detroit, Toledo & Ironton..... 2 mos. 454		327,794	29,696	357,490	44,636	111,980	13,406	60.95	26,898	268,592	163,462	218,526
Duluth & Iron Range..... Feb. 291		206,727	27,844	234,571	175,839	155,661	1,951	151.64	226,302	246,273	311,370	250,342
Duluth & Iron Range..... 2 mos. 291		413,454	55,688	469,142	351,678	311,322	3,902	151.64	452,604	491,545	622,740	500,684
Duluth, Missabe & Northern..... Feb. 406		347,141	61,321	408,462	132,446	210,146	2,861	174.09	340,249	373,475	386,136	101,590
Duluth, Missabe & Northern..... 2 mos. 406		694,282	122,642	816,924	264,892	420,292	5,722	174.09	680,498	746,950	772,272	203,180
Duluth, South Shore & Atlantic..... Feb. 591		277,439	85,148	362,587	300,295	426,518	5,890	72.94	735,292	764,505	768,857	108,354
Duluth, South Shore & Atlantic..... 2 mos. 591		554,878	170,296	725,174	600,590	853,036	11,780	72.94	1,470,586	1,528,511	1,537,714	216,708
Duluth, Winnipeg & Pacific..... Feb. 178		274,051	41,775	315,826	27,533	58,891	1,591	115.89	149,391	176,436	165,517	38,870
Duluth, Winnipeg & Pacific..... 2 mos. 178		548,102	83,550	631,652	55,070	117,782	3,182	115.89	298,782	352,872	331,034	77,748
Elgin, Joliet & Eastern..... Feb. 836		1,948,763	425,100	2,373,863	166,129	474,644	14,404	65.25	749,425	678,905	572,646	243,728
Elgin, Joliet & Eastern..... 2 mos. 836		3,897,526	850,200	4,747,726	332,258	949,288	28,808	65.25	1,498,850	1,347,810	1,145,292	487,538
El Paso & Southwestern..... Feb. 1,057		74,077	234,185	308,262	228,802	200,992	3,285	80.81	1,717,203	1,578,344	1,271,666	778,721
El Paso & Southwestern..... 2 mos. 1,057		148,154	468,370	616,524	457,604	401,984	6,570	80.81	3,434,406	3,156,688	2,543,332	1,557,442
Erie..... Feb. 1,989		6,573,049	1,044,535	7,617,584	776,219	2,461,445	128,770	93.34	538,341	227,814	360,409	1,509,991
Erie..... 2 mos. 1,989		13,146,098	2,089,070	15,235,168	1,552,438	4,922,890	257,540	93.34	1,076,682	455,628	720,818	3,019,982
Chicago & Erie..... Feb. 269		694,008	58,282	752,290	98,757	134,865	18,951	104.73	37,657	81,407	372,342	20,846
Chicago & Erie..... 2 mos. 269		1,388,016	116,564	1,504,580	197,514	269,730	37,902	104.73	75,314	162,814	744,684	41,692
New Jersey & New York..... Feb. 47		17,840	86,355	104,195	16,068	19,760	1,582	103.71	19,375	6,898	42,668	9,302
New Jersey & New York..... 2 mos. 47		35,680	172,710	208,390	32,136	39,520	3,164	103.71	38,750	13,796	85,336	18,604
N. Y., Susquehanna & Western..... Feb. 135		167,497	62,609	230,106	32,625	50,791	3,173	125.40	70,154	96,184	110,651	119,756
N. Y., Susquehanna & Western..... 2 mos. 135		334,994	125,218	460,212	65,250	101,582	6,346	125.40	140,308	192,368	221,302	239,512
Florida East Coast..... Feb. 764		768,555	624,126	1,392,681	216,861	200,569	15,325	60.92	641,142	593,623	545,858	22,858
Florida East Coast..... 2 mos. 764		1,537,110	1,248,252	2,785,362	433,722	401,138	30,650	60.92	1,282,284	1,187,246	1,091,716	49,718
Fonda, Johnston & Gloversville..... Feb. 68		31,222	67,284	98,506	11,418	10,969	419	72.56	26,286	27,711	23,560	7,537
Fonda, Johnston & Gloversville..... 2 mos. 68		62,444	134,568	197,012	22,836	21,938	838	72.56	52,572	55,422	47,120	15,064
Fort Smith & Western..... Feb. 233		107,472	24,506	131,978	34,633	41,764	5,043	113.76	19,426	20,030	20,716	20,252
Fort Smith & Western..... 2 mos. 233		214,944	49,012	263,956	69,266	83,528	10,086	113.76	38,852	40,060	41,432	40,508
Georgia..... Feb. 338		280,557	50,994	331,551	52,123	126,932	21,894	110.60	44,387	41,195	46,947	27,297
Georgia..... 2 mos. 338		561,114	101,988	663,102	104,246	253,864	43,788	110.60	88,774	82,390	93,894	54,596
Georgia & Florida..... Feb. 405		70,835	16,617	87,452	27,756	17,105	6,966	123.02	21,944	29,635	34,651	84,397
Georgia & Florida..... 2 mos. 405		141,670	33,234	174,904	55,512	34,210	13,932	123.02	43,888	59,270	69,302	168,794
Grand Trunk Western..... Feb. 352		683,840	157,968	841,808	114,870	206,894	24,140	103.46	65,721	76,742	81,199	103,150
Grand Trunk Western..... 2 mos. 352		1,367,680	315,936	1,683,616	229,740	413,788	48,280	103.46	131,442	153,484	162,398	206,300
Chic., Det. & Canada Gr. Tr. Int. Feb. 62		147,169	14,467	161,636	12,359	16,177	1,942	57.52	77,518	72,922	49,589	14,706
Chic., Det. & Canada Gr. Tr. Int. Feb. 62		294,338	28,934	323,272	24,718	32,354	3,884	57.52	155,036	145,366	99,170	30,190
Det., Grand Haven & Milwaukee..... Feb. 194		227,295	38,837	266,132	38,837	45,833	6,630	61.81	127,558	138,565	131,307	40,067
Det., Grand Haven & Milwaukee..... 2 mos. 194		454,590	77,674	532,264	77,674	91,666	13,260	61.81	255,116	276,931	262,614	80,374
Great Northern..... Feb. 8,170		4,024,478	1,215,411	5,239,889	813,797	1,592,988	140,703	103.14	183,901	947,323	894,649	270,035
Great Northern..... 2 mos. 8,170		8,048,956	2,430,822	10,479,778	1,627,594	3,185,976	281,406	103.14	367,802	1,894,646	1,789,295	540,070

REVENUES AND EXPENSES OF RAILWAYS

MONTH OF FEBRUARY AND TWO MONTHS OF CALENDAR YEAR 1921—CONTINUED

Name of road.	Average mileage operated during period.	Operating revenues			Operating expenses			Net from operation.	Operating income (or loss).	Net after comp. with last year.	Increase (or decr.) last year.
		Freight.	Passenger.	Total.	Way and structures.	Maintenance of equipment.	Traffic.	Trans- portation.	General.	Total.	
Green Bay & Western.....	Feb. 252	\$84,137	\$18,266	\$102,403	\$11,540	\$22,928	\$1,886	\$46,563	\$3,118	\$87,452	\$11,902
Gulf Coast Lines.....	2 mos. 252	717,100	210,698	927,798	234,031	155,438	3,982	37,398	8,248	191,969	20,596
Gulf & Ship Island.....	Feb. 307	163,957	40,428	204,385	184,666	19,719	30,832	349,594	.....	175,840	25,843
Gulf, Mobile & Northern.....	2 mos. 307	331,001	95,506	426,507	339,544	69,111	60,926	223,236	.....	351,613	392,329
Hocking Valley.....	Feb. 350	560,069	107,353	667,422	699,837	413,939	11,912	91,143	12,189	196,171	7,884
Illinois Central.....	2 mos. 350	1,348,111	222,525	1,570,636	1,652,821	962,115	23,148	16,818	26,478	2,100,200	18,519
Yazoo & Miss. Valley.....	Feb. 1,381	1,276,391	337,376	1,613,767	1,731,010	291,139	22,899	159,259	35,274	2,100,200	18,519
International & Great Northern.....	2 mos. 1,381	2,638,212	771,858	3,410,070	3,410,070	304,384	22,899	159,259	35,274	2,100,200	18,519
Kansas City, Mexico & Orient.....	Feb. 272	107,840	126,568	234,408	126,568	28,063	5,271	91,143	12,189	196,171	7,884
Kan. City, Mex. & Orient of Tex.....	Feb. 465	216,132	234,408	450,540	254,720	105,109	10,182	16,818	26,478	347,831	21,110
Kansas City Southern.....	2 mos. 465	124,351	12,847	137,198	144,325	59,850	5,375	10,485	5,394	214,967	49,876
Texasarkana & Fort Smith.....	Feb. 779	1,343,777	178,605	1,522,382	1,640,061	258,645	34,517	630,348	69,329	1,177,092	188,939
Kansas City Terminal.....	2 mos. 779	2,777,022	395,001	3,172,023	3,406,400	536,226	17,899	14,303	142,221	2,460,671	31,574
Kansas, Oklahoma & Gulf.....	Feb. 329	146,478	17,739	164,217	176,474	15,753	4,906	8,917	7,362	125,733	3,698
Lake Superior & Ishpeming.....	2 mos. 329	335,391	37,939	373,330	388,950	29,168	8,975	164,082	15,615	260,486	41,907
Lake Terminal.....	Feb. 27	.....	.....	.....	127,972	10,528	17,713	55,524	3,200	89,499	90,311
Leligh & Hudson River.....	2 mos. 27	.....	.....	.....	18,524	4,590	18,524	18,524	5,822	19,510	17,981
Leligh & New England.....	Feb. 13	.....	.....	.....	264,660	21,811	42,990	18,524	5,822	19,510	17,981
Leligh Valley.....	2 mos. 13	.....	.....	.....	18,524	4,590	18,524	18,524	5,822	19,510	17,981
Los Angeles & Salt Lake.....	Feb. 1,168	9,568,124	1,593,358	11,161,482	11,553,950	2,124,384	4,650,050	205,522	5,951,571	12,135,521	1,181,317
Louisiana & Arkansas.....	2 mos. 1,168	1,890,953	1,026,902	2,917,855	3,190,237	693,394	689,845	114,900	77,332	2,923,526	504,755
Louisiana Ry. & Nav. Co.....	Feb. 302	199,974	31,967	231,941	249,136	49,795	6,759	9,026	27,894	277,894	4,348
Louisville & Nashville.....	2 mos. 302	507,006	72,548	579,554	603,835	119,944	12,537	231,955	18,530	508,503	50,395
Louisville, Henderson & St. Louis.....	Feb. 343	199,647	31,334	230,981	254,758	86,689	9,930	136,429	12,430	282,792	37,895
Maine Central.....	2 mos. 343	533,769	62,973	596,742	641,112	176,639	20,027	331,125	25,274	661,327	13,857
Midland Valley.....	Feb. 5,043	6,249,629	1,816,341	8,065,970	8,520,179	1,262,853	216,006	4,778,060	260,024	9,449,589	1,988,229
Mississippi Central.....	2 mos. 5,043	13,429,495	4,212,658	17,642,153	18,662,361	2,753,990	439,592	9,732,142	533,682	19,728,922	3,683,653
Missouri, Kansas & Texas.....	Feb. 199	147,878	54,154	202,032	244,648	43,109	6,256	95,446	9,129	191,035	30,774
Mo., Kan. & Texas of Texas.....	2 mos. 199	298,599	120,935	419,534	478,867	96,882	13,024	192,608	18,333	398,020	34,799
Monongahela.....	Feb. 1215	1,295,631	331,121	1,626,752	2,311,623	420,949	12,724	1,036,554	45,670	1,767,434	481,243
Minneapolis & St. Louis.....	2 mos. 1,215	2,787,621	705,624	3,493,245	3,700,052	830,301	1,404,731	2,953,4	112,285	4,622,722	501,817
Minneapolis, St. P. & S. Marie.....	Feb. 388	244,690	337,967	582,657	582,657	79,419	4,596	239,098	16,919	299,632	42,791
Missouri & North Arkansas.....	2 mos. 388	562,897	177,661	740,558	773,371	190,225	9,919	288,443	55,578	695,080	22,409
Missouri & North Arkansas.....	Feb. 164	61,590	17,880	79,470	83,296	12,803	2,408	31,062	6,440	80,639	3,142
Missouri & North Arkansas.....	2 mos. 164	127,706	40,219	167,925	174,124	31,377	5,586	69,605	17,474	178,126	16,223
Missouri & North Arkansas.....	2 mos. 364	143,512	30,247	173,759	199,659	37,152	3,364	131,414	6,559	129,946	14,828
Missouri, Kansas & Texas.....	Feb. 1,715	1,751,846	593,746	2,345,592	2,486,645	330,330	46,521	948,852	109,424	2,117,510	369,135
Mo., Kan. & Texas of Texas.....	2 mos. 1,715	3,716,376	1,333,740	5,050,116	5,412,678	695,332	88,956	2,988,333	215,960	4,167,578	790,740
Wichita Falls & Northwestern.....	Feb. 1,739	1,405,724	2,098,301	3,504,025	3,504,025	345,674	42,333	90,949	1,737,973	3,162,998	340,065
Missouri Pacific.....	2 mos. 1,739	3,021,929	1,208,628	4,230,557	4,560,763	650,312	87,577	2,096,662	186,919	3,809,817	45,058
Wichita Falls & Northwestern.....	Feb. 328	148,450	29,727	178,177	185,418	29,357	691	70,689	8,485	143,177	18,457
Missouri Pacific.....	2 mos. 328	328,404	64,286	392,690	408,795	57,419	2,016	159,875	17,495	305,722	58,925
Monongahela.....	2 mos. 7,300	6,254,979	1,882,412	8,137,391	8,356,643	1,293,709	177,000	4,096,706	279,938	7,971,758	1,029,105
Monongahela.....	2 mos. 7,300	12,832,817	3,449,984	16,282,801	17,908,983	2,758,179	363,323	8,678,809	560,940	16,803,988	2,655,782
Monongahela.....	Feb. 106	244,489	35,360	289,849	285,908	65,377	3,197	83,297	8,074	207,638	50,513
Monongahela.....	2 mos. 106	679,589	76,251	755,840	766,187	146,106	5,063	224,467	15,901	512,139	109,726

REVENUES AND EXPENSES OF RAILWAYS

MONTH OF FEBRUARY AND TWO MONTHS OF CALENDAR YEAR 1921—CONTINUED

Name of road.	Average mileage operated during period.	Operating revenues			Operating expenses			Operating ratio.	Net from operation	Operating income (or loss).	Net after rentals.	Increase (or decrease) last year.
		Freight.	Passenger.	Total.	Way and structures.	Traffic.	Trans- portation.					
Monongahela Connecting	7	.....	.....	\$53,305	\$10,756	\$16,307	\$35,555	131.97	\$17,042	\$18,937	\$23,252	\$95,569
Montour	2 mos.	.....	.....	144,383	29,720	46,277	1,152	129.25	4,238	46,387	59,153	192,587
Montour	56	.....	.....	\$1,085	22,309	62,571	1,044	126.64	24,335	25,375	9,069	53,546
Nashville, Chattanooga & St. Louis.	2 mos.	.....	.....	217,832	43,174	121,264	2,387	117.35	37,803	44,814	24,474	63,231
Nashville, Chattanooga & St. Louis.	2 mos.	.....	.....	420,506	1,627,123	417,429	75,262	100.85	13,888	45,041	35,307	249,096
Nashville, Chattanooga & St. Louis.	2 mos.	.....	.....	3,383,451	474,915	902,307	154,242	101.06	34,579	116,904	40,799	124,019
Nevada Northern	164	.....	.....	37,606	6,309	9,779	585	96.50	1,674	8,067	4,403	41,188
Nevada Northern	2 mos.	.....	.....	13,521	101,630	13,521	1,310	93.92	7,946	17,177	8,661	98,810
Newburgh & South Shore	7	.....	.....	116,111	12,943	30,830	59,659	93.16	7,946	1,237	8,064	38,463
New Orleans Great Northern	2 mos.	.....	.....	277,356	26,219	70,688	21,900	121.66	21,966	2,645	4,483	49,956
New Orleans Great Northern	2 mos.	.....	.....	37,002	200,193	30,322	5,769	84.11	31,807	16,502	18,378	21,925
New Orleans Great Northern	2 mos.	.....	.....	420,803	67,612	68,431	10,648	85.09	62,757	32,335	39,369	33,083
New York Central	6,078	14,813,093	6,359,797	23,172,757	2,885,495	297,686	11,532,987	95.21	1,110,738	456,041	430,322	1,541,535
New York Central	2 mos.	.....	.....	50,533,345	6,039,521	623,060	25,350,888	93.12	2,468,632	710,674	687,159	4,808,831
Cincinnati Northern	2 mos.	.....	.....	238,860	36,333	51,312	3,773	91.45	20,378	5,766	12,929	31,359
Cincinnati Northern	2 mos.	.....	.....	491,861	81,948	115,675	10,388	92.71	35,845	6,616	313	64,233
Cleveland, Cin., Chic. & St. Louis.	2 mos.	.....	.....	5,763,703	823,021	1,539,955	125,281	96.11	224,467	91,239	368,759	1,889,295
Cleveland, Cin., Chic. & St. Louis.	2 mos.	.....	.....	12,724,395	1,651,055	2,858,013	246,266	89.63	1,319,053	687,710	75,888	3,162,284
Indiana Harbor Belt	120	.....	.....	682,107	100,434	159,692	4,126	101.19	8,097	18,784	101,915	89,639
Indiana Harbor Belt	2 mos.	.....	.....	1,466,845	248,795	300,321	7,445	105.97	89,186	110,561	306,487	203,066
Kanawha & Michigan	176	222,090	55,987	287,505	72,254	174,581	4,746	139.35	113,133	148,789	59,351	167,727
Kanawha & Michigan	2 mos.	.....	.....	653,492	146,403	357,549	9,113	127.40	179,061	250,373	98,510	202,878
Lake Erie & Western	138	562,660	62,052	648,378	124,241	494,450	27,576	106.83	44,285	88,967	84,402	46,652
Lake Erie & Western	2 mos.	.....	.....	1,431,022	288,987	197,236	39,898	112.71	181,901	271,297	276,712	318,195
Michigan Central	1,865	3,043,160	1,305,914	4,715,548	638,629	1,040,964	95,049	94.97	237,206	10,109	30,114	547,600
Pittsburgh & Lake Erie	2 mos.	.....	.....	10,844,045	1,360,623	2,446,528	206,977	90.05	1,073,353	626,899	476,952	870,619
Pittsburgh & Lake Erie	2 mos.	.....	.....	2,198,991	365,692	530,393	24,208	87.49	275,097	56,296	270,939	56,350
Toledo & Ohio Central	502	657,180	76,455	756,292	107,568	171,688	11,559	88.90	80,858	25,003	84,998	65,186
New York, Chic. & St. Louis.	2 mos.	.....	.....	1,436,317	155,714	447,240	24,301	98.17	30,162	81,550	9,333	116,631
New York, Chic. & St. Louis.	2 mos.	.....	.....	1,945,663	195,164	438,266	68,674	97.15	250,060	169,053	174,391	109,884
N. Y., New Haven & Hartford	1,986	3,639,535	3,707,622	8,157,805	1,335,333	2,306,891	59,681	80.80	808,405	600,383	644,852	4,682
Central New England	301	664,573	24,775	713,604	82,468	90,420	4,536	113.70	1,117,687	1,513,672	1,858,788	866,242
New York, Ontario & Western	569	719,203	121,697	969,341	183,785	229,674	19,894	73.18	368,511	326,669	186,359	959,876
Norfolk & Western	2 mos.	.....	.....	1,288,868	230,110	438,392	31,353	92.91	68,720	33,242	37,007	84,655
Norfolk & Western	2 mos.	.....	.....	3,659,621	454,665	1,355,991	154,044	92.13	29,695	41,308	28,349	224,258
Norfolk Southern	944	483,761	144,222	630,510	88,187	85,644	31,891	88.92	1,450,340	670,063	1,258,917	133,594
Norfolk Southern	2 mos.	.....	.....	1,168,197	185,207	172,267	25,748	95.66	50,720	12,631	33,212	155,764
Norfolk Southern	2 mos.	.....	.....	5,770,156	845,488	1,604,906	247,535	102.24	129,452	902,365	690,581	1,679,412
Northwestern Pacific	6,655	8,414,698	2,690,195	12,230,250	1,679,172	2,343,644	233,348	99.92	10,248	1,534,544	1,122,897	4,158,975
Northwestern Pacific	2 mos.	.....	.....	474,403	117,268	90,690	5,220	100.64	3,616	33,644	31,690	24,735
Pennsylvania R. R.	534	468,532	369,308	953,924	269,148	179,168	11,348	106.16	58,774	119,850	118,835	121,831
Pennsylvania R. R.	2 mos.	.....	.....	37,490,488	4,598,130	12,308,952	422,585	101.85	694,549	1,845,402	2,577,081	7,651,839
Baltimore, Chesapeake & Atlantic	7,358	53,517,694	22,076,440	82,130,698	9,248,120	26,088,648	919,637	99.43	469,095	2,371,161	3,730,748	9,698,047
Cin., Lebanon & Northern	87	77,909	24,364	104,226	6,395	24,295	1,074	105.82	5,748	9,556	9,552	35,786
Cin., Lebanon & Northern	2 mos.	.....	.....	193,173	19,692	73,862	2,605	126.38	5,748	9,556	9,552	35,786
Cin., Lebanon & Northern	2 mos.	.....	.....	193,173	19,692	73,862	2,605	126.38	5,748	9,556	9,552	35,786
Grand Rapids & Indiana	569	320,900	221,661	583,690	62,281	176,920	10,506	116.13	75,430	115,227	135,004	93,592
Long Island	569	828,200	406,944	1,335,343	141,669	372,040	24,440	106.27	83,784	162,643	194,005	238,501
Long Island	2 mos.	.....	.....	1,718,609	240,775	395,872	12,709	107.26	124,737	234,518	268,589	461,128
Maryland, Delaware & Virginia	82	51,976	14,921	69,333	10,156	15,235	694	110.71	373,869	616,964	671,941	350,979
N. Y., Phila. & Norfolk	121	374,564	70,595	484,416	46,752	133,819	14,657	122.53	31,935	36,138	36,815	63,428
Pittsburgh, Cin., Chic. & St. Louis	2,383	4,503,100	1,107,246	6,060,842	787,556	2,762,677	107,670	100.85	9,069	56,682	72,939	86,818
West Jersey & Seashore	359	11,232,400	3,336,473	15,843,316	1,729,420	5,779,664	249,414	108.14	1,289,004	2,106,484	2,700,337	2,111,668
Peoria & Pekin Union	19	26,025	5,569	30,681	3,381	11,144	510,724	123.78	175,452	210,658	243,696	89,734
Pere Marquette	2,238	1,640,745	383,805	2,024,550	260,400	1,099,450	104,510	115.67	310,191	420,570	444,730	267,377
Philadelphia & Reading	1,126	5,442,973	866,913	6,953,456	679,077	1,984,515	22,465	92.54	492,017	250,660	111,242	1,291,975
Philadelphia & Reading	2 mos.	.....	.....	1,874,817	14,467,077	4,471,789	111,198	92.40	1,098,929	616,332	288,794	1,291,975

REVENUES AND EXPENSES OF RAILWAYS

MONTH OF FEBRUARY AND TWO MONTHS OF CALENDAR YEAR 1921—CONTINUED

Name of road.	Average mileage operated during period.	Operating revenues			Operating expenses			General.	Total.	Operating ratio.	Net from railway operation.	Operating income (or loss).	Net after rentals.	Increase (or decrease) comp. with last year.
		Freight.	Passenger.	Total (inc. misc.)	Way and structures.	Traffic.	Trans- portation.							
East St. Louis Connecting.....Feb.	3	.....	.....	.....	.....	.....	.....	.....	\$102,505	88.79	\$12,940	\$10,276	—\$653	—\$7,634
.....2 mos.	3	.....	.....	.....	.....	.....	.....	.....	229,231	89.27	27,544	22,255	—3,035	—62,988
St. L. Merchants' Bridge Term.....Feb.	9	.....	.....	.....	.....	.....	.....	.....	278,365	104.52	—12,272	—25,212	—12,723	—39,785
.....2 mos.	9	.....	.....	.....	.....	.....	.....	.....	594,453	100.52	—3,041	—28,847	—5,015	—100,815
St. Louis Transfer Ry.....Feb.	6	.....	.....	.....	.....	.....	.....	.....	53,069	59.81	35,656	35,294	31,686	13,777
.....2 mos.	6	.....	.....	.....	.....	.....	.....	.....	121,252	54.55	101,009	100,353	91,727	65,298
Texas & Pacific Ry.....Feb.	1,946	.....	.....	.....	.....	.....	.....	.....	2,587,095	88.64	331,643	203,636	72,889	226,119
.....2 mos.	1,946	.....	.....	.....	.....	.....	.....	.....	5,631,218	87.21	856,016	570,127	255,064	256,431
Toledo, Peoria & Western.....Feb.	247	.....	.....	.....	.....	.....	.....	.....	160,958	112.28	—17,601	—27,600	—20,280	12,100
.....2 mos.	247	.....	.....	.....	.....	.....	.....	.....	358,877	118.93	—57,120	—77,120	—58,420	—77,092
Toledo, St. Louis & Western.....Feb.	454	.....	.....	.....	.....	.....	.....	.....	596,339	85.43	101,684	70,684	48,809	47,933
.....2 mos.	454	.....	.....	.....	.....	.....	.....	.....	1,253,783	86.24	200,092	138,092	100,882	42,821
Trinity & Brazos Valley.....Feb.	368	.....	.....	.....	.....	.....	.....	.....	194,591	112.54	—21,678	—28,378	—37,751	81,644
.....2 mos.	368	.....	.....	.....	.....	.....	.....	.....	447,056	106.22	—26,185	—39,585	—63,565	102,458
Ulster & Delaware.....Feb.	128	.....	.....	.....	.....	.....	.....	.....	96,015	135.38	—25,092	—31,346	—32,165	13,976
.....2 mos.	128	.....	.....	.....	.....	.....	.....	.....	214,677	140.22	—61,572	—74,078	—75,260	—20,245
Union R. R. of Penna.....Feb.	45	.....	.....	.....	.....	.....	.....	.....	747,237	83.71	145,366	134,700	172,244	227,064
.....2 mos.	45	.....	.....	.....	.....	.....	.....	.....	1,621,919	85.22	281,379	260,047	347,269	442,925
Union Pacific.....Feb.	3,614	.....	.....	.....	.....	.....	.....	.....	5,456,981	78.54	1,491,406	922,295	801,897	1,499,845
.....2 mos.	3,614	.....	.....	.....	.....	.....	.....	.....	12,461,100	80.70	2,980,591	1,843,846	1,562,306	—5,133,643
Oregon Short Line.....Feb.	2,359	.....	.....	.....	.....	.....	.....	.....	1,969,232	83.80	380,566	82,998	64,010	—1,060,481
.....2 mos.	2,359	.....	.....	.....	.....	.....	.....	.....	4,619,139	90.87	464,246	115,539	163,484	—2,727,896
Oregon Wash. R. R. & Nav. Co.....Feb.	2,223	.....	.....	.....	.....	.....	.....	.....	2,050,686	101.53	—30,804	—211,748	—285,519	—571,676
.....2 mos.	2,223	.....	.....	.....	.....	.....	.....	.....	4,488,667	110.55	—428,300	—790,759	—942,786	—1,736,431
St. Joseph & Grand Island.....Feb.	258	.....	.....	.....	.....	.....	.....	.....	215,287	87.73	30,112	16,624	5,319	24,701
.....2 mos.	258	.....	.....	.....	.....	.....	.....	.....	487,440	96.83	15,909	—11,719	—33,695	—45,710
Utah.....Feb.	98	.....	.....	.....	.....	.....	.....	.....	69,225	70.57	28,878	24,740	20,682	—53,735
.....2 mos.	98	.....	.....	.....	.....	.....	.....	.....	156,415	73.61	56,668	47,803	40,782	—102,209
Virginian.....Feb.	5,76	.....	.....	.....	.....	.....	.....	.....	986,545	87.27	143,853	49,210	95,530	121,507
.....2 mos.	5,76	.....	.....	.....	.....	.....	.....	.....	2,202,834	78.02	620,697	431,413	526,468	165,067
Wabash.....Feb.	2,472	.....	.....	.....	.....	.....	.....	.....	3,966,099	89.51	465,705	328,748	106,598	827,319
.....2 mos.	2,472	.....	.....	.....	.....	.....	.....	.....	8,481,246	92.71	666,576	393,113	38,516	346,926
Western Maryland.....Feb.	797	.....	.....	.....	.....	.....	.....	.....	1,304,867	86.91	195,957	145,957	231,786	588,999
.....2 mos.	797	.....	.....	.....	.....	.....	.....	.....	2,811,210	87.79	590,885	260,885	468,888	640,228
Western Pacific.....Feb.	1,011	.....	.....	.....	.....	.....	.....	.....	733,776	80.78	67,730	7,345	80,361	—56,447
.....2 mos.	1,011	.....	.....	.....	.....	.....	.....	.....	1,608,458	91.08	157,623	20,734	170,216	—433,927
Wheeling & Lake Erie.....Feb.	511	.....	.....	.....	.....	.....	.....	.....	867,552	105.08	—41,914	—113,327	—131,699	—164,287
.....2 mos.	511	.....	.....	.....	.....	.....	.....	.....	1,917,662	102.34	—43,788	—195,614	—245,365	—222,549
Atchafalpa, Topeka & Santa Fe.....Feb.	1,907	.....	.....	.....	.....	.....	.....	.....	\$2,264,795	90.27	\$244,251	\$170,120	\$89,481	—\$81,666
.....2 mos.	1,907	.....	.....	.....	.....	.....	.....	.....	771,494	113.25	—90,234	—108,728	—157,144	—254,546
Atlanta, Birmingham & Atlantic.....Feb.	9,389	.....	.....	.....	.....	.....	.....	.....	511,495	135.99	—135,354	—151,815	—138,736	—160,760
.....2 mos.	9,389	.....	.....	.....	.....	.....	.....	.....	11,772,823	83.74	2,226,977	1,491,475	1,311,859	—3,396,647
Chicago, Burlington & Quincy.....Feb.	1,099	.....	.....	.....	.....	.....	.....	.....	992,451	71.96	386,747	311,700	320,897	46,994
.....2 mos.	1,099	.....	.....	.....	.....	.....	.....	.....	838,814	83.36	167,399	133,463	139,884	—73,077
Fort Worth & Denver City.....Feb.	454	.....	.....	.....	.....	.....	.....	.....	137,477	87.40	19,785	14,972	367	—46,033
.....2 mos.	454	.....	.....	.....	.....	.....	.....	.....	485,968	126.94	—103,132	—128,132	—138,110	—60,201
Wichita Valley.....Feb.	255	.....	.....	.....	.....	.....	.....	.....	134,204	65.71	70,040	65,443	43,531	54,773
.....2 mos.	255	.....	.....	.....	.....	.....	.....	.....	406,538	118.58	—63,691	—66,827	—117,986	—10,354
Colorado & Wyoming.....Feb.	43	.....	.....	.....	.....	.....	.....	.....	367,638	94.85	19,945	6,393	8,513	—1,792
Duluth, South Shore & Atlantic.....Feb.	591	.....	.....	.....	.....	.....	.....	.....	63,171	628.32	4,934	—38,050	—55,818	—11,792
Grand Trunk Western.....Feb.	352	.....	.....	.....	.....	.....	.....	.....	378,595	97.99	7,759	—8,284	—40,662	—60,673
.....2 mos.	352	.....	.....	.....	.....	.....	.....	.....	573,063	106.16	—5,659	—91,236	—974,515	—837,114
Chic., Det. & Canada Gr. Tr. Inc.....Feb.	62	.....	.....	.....	.....	.....	.....	.....	134,204	65.71	70,040	65,443	43,531	54,773
.....2 mos.	62	.....	.....	.....	.....	.....	.....	.....	406,538	118.58	—63,691	—66,827	—117,986	—10,354
Det., Grand Haven & Milwaukee.....Feb.	194	.....	.....	.....	.....	.....	.....	.....	367,638	94.85	19,945	6,393	8,513	—1,792
.....2 mos.	194	.....	.....	.....	.....	.....	.....	.....	63,171	628.32	4,934	—38,050	—55,818	—11,792
Gulf, Mobile & Northern.....Feb.	463	.....	.....	.....	.....	.....	.....	.....	134,204	65.71	70,040	65,443	43,531	54,773
.....2 mos.	463	.....	.....	.....	.....	.....	.....	.....	406,538	118.58	—63,691	—66,827	—117,986	—10,354
Lake Superior & Ishpeming.....Feb.	33	.....	.....	.....	.....	.....	.....	.....	378,595	97.99	7,759	—8,284	—40,662	—60,673
.....2 mos.	33	.....	.....	.....	.....	.....	.....	.....	573,063	106.16	—5,659	—91,236	—974,515	—837,114
Louisiana Ry. & Navigation Co.....Feb.	343	.....	.....	.....	.....	.....	.....	.....	134,204	65.71	70,040	65,443	43,531	54,773
.....2 mos.	343	.....	.....	.....	.....	.....	.....	.....	406,538	118.58	—63,691	—66,827	—117,986	—10,354
Memphis, St. Paul & S. S. Marie.....Feb.	161	.....	.....	.....	.....	.....	.....	.....	367,638	94.85	19,945	6,393	8,513	—1,792
.....2 mos.	161	.....	.....	.....	.....	.....	.....	.....	63,171	628.32	4,934	—38,050	—55,818	—11,792
Missouri & North Arkansas.....Feb.	364	.....	.....	.....	.....	.....	.....	.....	378,595	97.99	7,759	—8,284	—40,662	—60,673
.....2 mos.	364	.....	.....	.....	.....	.....	.....	.....	573,063	106.16	—5,659	—91,236	—974,515	—837,114
Missouri, Kansas & Texas of Texas.....Feb.	1,739	.....	.....	.....	.....	.....	.....	.....	2,114,714	86.26	336,994	289,553	49,794	530,603
.....2 mos.	1,739	.....	.....	.....	.....	.....	.....	.....	116,275	127.66	—25,197	—7,450	—35,900	—97,018
Monongahela Connecting.....Feb.	56	.....	.....	.....	.....	.....	.....	.....	128,988	111.51	—13,314	—17,426	—9,685	—5,685
.....2 mos.	56	.....	.....	.....	.....	.....	.....	.....	49,583	91.68	5,861	—5,358	—2,209	57,622
Montour.....Feb.	164	.....	.....	.....	.....	.....	.....	.....	2,114,714	86.26	336,994	289,553	49,794	530,603
.....2 mos.	164	.....	.....	.....	.....	.....	.....	.....	116,275	127.66	—25,197	—7,450	—35,900	—97,018
Nevada Northern.....Feb.	164	.....	.....	.....	.....	.....	.....	.....	128,988	111.51	—13,314	—17,426	—9,685	—5,685
.....2 mos.	164	.....	.....	.....	.....	.....	.....	.....	49,583	91.68	5,861	—5,358	—2,209	57,622

MONTH OF JANUARY, 1921

REVENUES AND EXPENSES OF RAILWAYS

MONTH OF JANUARY, 1921—CONTINUED

Name of road.	Average mileage operated during period.	Operating revenues			Operating expenses				Net from railway operation.	Operating income (or loss).	Net after rentals.	Increase (or decr.) comp. with last year.
		Freight.	Passenger.	Total (inc. misc.)	Way and structures.	Maintenance of Equip-ment.	Traffic.	Trans- portation.				
Newburgh & South Shore.....	7	.....	.....	\$161,245	\$13,276	\$39,818	.....	\$89,430	91.31	\$14,020	\$3,882	\$11,492
Cincinnati Northern.....	245	\$226,774	\$19,046	253,481	45,615	64,364	4,816	114,809	93.90	15,467	850	32,675
Norfolk & Western.....	2,220	6,269,640	987,730	7,436,716	1,031,137	1,737,214	76,286	3,410,372	86.48	1,005,396	615,153	296,780
Northwestern Pacific.....	534	228,026	492,465	479,521	151,880	88,478	6,123	210,352	111.63	55,758	86,207	146,616
Long Island.....	398	539,523	1,060,742	1,772,494	245,671	428,582	21,283	1,232,523	114.06	249,132	363,446	110,150
Quincy, Omaha & Kansas City.....	255	70,470	28,000	105,521	32,899	22,581	826	80,898	132.48	34,272	38,421	33,619
St. Louis-San Francisco.....	4,760	4,677,797	1,914,924	7,035,213	722,757	1,421,503	87,234	3,003,140	77.99	1,548,677	1,269,004	699,494
Fort Worth & Rio Grande.....	235	81,069	59,095	150,752	51,441	25,583	3,188	99,189	124.57	37,039	73,213	74,053
St. Louis, San Francisco & Texas.....	134	158,526	24,773	193,699	60,764	46,337	3,183	114,708	120.27	39,253	81,247	42,680
San Antonio & Aransas Pass.....	738	352,305	96,659	477,519	165,478	93,922	10,816	279,518	119.67	93,936	107,247	45,089
Southern Pacific—												
Arizona Eastern.....	382	261,363	58,004	346,667	56,840	50,790	3,488	120,224	46.18	86,596	59,536	50,031
Atlantic S. S. Lines.....	...	669,784	59,357	769,059	18,003	156,041	18,094	678,479	115.92	122,431	133,959	123,607
Spokane, Portland & Seattle.....	549	360,860	154,652	564,779	83,751	107,595	9,342	246,176	85.49	81,968	8,536	190,327
Terminal R. R. Assoc. of St. Louis.....	36	.....	.....	399,622	84,524	42,206	967	178,049	79.72	81,043	38,106	10,795
East St. Louis Connecting.....	3	.....	.....	141,330	23,514	8,612	4,261	126,726	89.67	14,604	11,979	55,354
St. Louis Merchants Bldg. Terminal.	9	.....	.....	325,268	62,285	30,161	916	215,490	91.18	19,180	3,636	61,065
St. Louis Transfer.....	6	.....	.....	133,536	10,299	4,749	192	50,632	51.06	65,353	65,059	51,520
Oregon Short Line.....	2,359	1,948,360	545,160	2,733,587	623,551	714,554	42,222	1,065,633	96.94	83,680	198,537	1,717,414
Oregon, Washington, R. R. & Nav. Co.,	2,223	1,309,131	550,887	2,040,485	571,293	551,026	53,664	1,094,327	119.48	397,496	579,012	1,164,745
St. Joseph & Grand Island.....	258	207,817	36,365	287,949	46,658	61,358	2,138	141,891	105.51	14,204	27,944	70,411

Traffic News

Application of the Denver & Salt Lake for permission to continue tri-weekly passenger service instead of resuming daily passenger service, was granted by the Colorado Utilities Commission on April 4.

The Interstate Commerce Commission on April 11 vacated three service orders issued last year, which provided for priority for coal transportation, which have been under suspension for some time. These are Service Orders No. 5, No. 10 and No. 11, applying to lake coal and to New England coal.

The Car Service Division of the American Railway Association announces that the district embargo zone with headquarters at Fort Worth, Texas, will be consolidated on April 15 with the zone headquarters at Chicago. The roads now assigned to the Fort Worth district have been reassigned to the Chicago district. District embargo headquarters will thereafter be maintained at Washington, Montreal, Chicago and Winnipeg.

The University of California Traffic Association, at its meeting on March 28, in the Monadnock Building, San Francisco, listened to an address by Mr. Lowe, of the Freight Claim Department of the Southern Pacific, on the method of handling freight claims in the office of that company. He followed through a specific claim on a cantaloupe shipment from origin to settlement. The University of California Traffic Association was formed by the graduates of the Extension Division of the University of California upon completion of a ten months' course in traffic management and transportation. A second class is now going through the course. M. B. Baker, of the United States Rubber Company, of San Francisco, is president of the association.

At the annual banquet of the Chicago Traffic Club on March 31, the following officers were installed: president, R. B. Robertson, assistant freight traffic manager, Union Pacific; first vice-president, J. A. Brough, traffic manager, Crane Company; second vice-president, J. E. Weller, freight traffic manager, Pennsylvania; third vice-president, J. H. Walden, president, Chicago Railway Printing Company; secretary, E. S. Buckmaster, general agent, American Railway Express Company, and treasurer, J. F. Coykendall, treasurer, Chicago, Great Western; directors for two years, E. L. Dalton, general traffic manager, Montgomery Ward & Company; C. E. Barry, general western agent, Livermore, Dearborn & Company, Inc.; W. J. M. Lahl, traffic manager, American Seating Company, and T. J. Wall, general agent, passenger department, Canadian Pacific.

Anthracite Shipments in February

The shipments of anthracite in February, as reported to the Anthracite Bureau of Information, in Philadelphia, established a new record for that month, amounting to 5,966,101 gross tons. The nearest approach to this figure for February shipments during a normal year, was in February, 1912, when the shipments amounted to 5,875,968 tons, and the next nearest approach was in the war year of 1918, when 5,812,082 gross tons were shipped. The shipments last month exceeded the previous month of January, a long month, by 225,563 tons, and exceeded February of last year by over 900,000 tons.

Shipments by originating carriers were:

	February, 1921	January, 1921
P. & R.....	1,170,753	1,172,873
L. V. R. R.....	1,063,508	1,058,127
C. R. R. of N. J.....	515,551	470,704
D. L. & W.....	920,788	814,491
D. & H. Co.....	813,191	814,491
Penna. R. R.....	426,350	451,879
Erie R. R.....	633,706	606,602
N. Y. O. & W.....	153,017	156,564
L. & N. E. R. R.....	269,237	99,038
Total.....	5,966,101	5,740,538

Commission and Court News

Interstate Commerce Commission

The commission has suspended until August 7, the operation of certain proposed reductions in freight rates on crude petroleum in tank cars from 10 to 6½ cents per 100 lb. from Sabine, Port Arthur, Chaison and Beaumont, Texas, to Sulphur Mine, La.

The commission has suspended, from April 17 until August 15, the operation of certain schedules published in a Kansas City, Mexico & Orient tariff, proposing increased rates on grain from points in Oklahoma and Kansas to Algiers, New Orleans, La., and other points in Louisiana.

The commission has further suspended until May 14 the operation of schedules providing increased freight rates between Ohio river crossings, St. Louis, Mo., and points related thereto on the one hand, and Memphis, Tenn., lower Mississippi river crossings and Gulf ports and points related thereto and points in Mississippi Valley territory on the other hand between other points in Mississippi Valley territory.

The commission has suspended from April 8 until August 6 the operation of certain schedules, which provide for the elimination of the application of rates on lumber and other forest products from California and Oregon to various points in Minnesota via the Chicago, St. Paul, Minneapolis & Omaha and the Great Northern, leaving combination rates applicable instead, resulting in increases varying from 4½ to 9 cents per 100 pounds.

Personnel of Commissions

President Harding in considering candidates for appointments to the two vacancies on the Interstate Commerce Commission has before him communications from the Engineering Council of the Federated Engineering Societies urging the appointment of an engineer as a member of the commission and submitting the names of six prominent engineers as candidates. It is understood also that Herbert Hoover, Secretary of Commerce, who is president of the organization, has discussed the matter with the President. Other candidates who have been strongly urged upon the President, usually by congressional delegations or by commercial organizations from various sections, include E. I. Lewis, chairman of the Public Service Commission of Indiana; W. A. Wimbish, a traffic lawyer of Atlanta, Ga.; James B. Campbell, a traffic lawyer of Spokane, Wash.; Mason Manghum, counsel for the Virginia Corporation Commission, and Henry J. Ford, whose recess appointment as a member of the commission expired on March 4 and who has since been retained by the commission as an attorney.

Court News

Recovery of Connecting Carriers' Charges Notwithstanding Claims for Damages

A shipment was diverted from the original consignee to parties who ordered a further diversion, the railroad in possession of the goods agreeing to deliver the car in time for a certain train on the terminal road. The car was not so delivered, however, and the consignee suffered damage thereby. In an action by the terminal road against the last consignee for its and all prior charges, it was held that the plaintiff could recover those accruing to the railroad which had been in default in failing to deliver the car to the terminal road in time for its train; leaving the parties to bring action directly against the road in default to recover such damages as they could show they had sustained by the failure to keep its agreement to deliver.—Grand Trunk v. Satuloff, 182 N. Y. Supp. 81.

Equipment and Supplies

Locomotives

The GREAT WESTERN OF BRAZIL has ordered 4 4-6-0 type locomotives from the Baldwin Locomotive Works.

The HAWAII CONSOLIDATED RAILWAY, LTD., has ordered 1 4-6-0 type locomotive from the Baldwin Locomotive Works.

The CERVECERIA CUAUHEMOC, Monterey, Mexico, has ordered 2 Consolidation type locomotives from the American Locomotive Company. These locomotives will have 19 by 26 in. cylinders and a total weight in working order of 138,000 lbs.

MITSUMI & Co., 65 Broadway, New York, representing a Chinese banking group and on behalf of the Chinese Ministry of Communications, are inquiring for 30 Prairie type locomotives for the Pekin-Hankow, and 2 Mikado and 3 Pacific type locomotives for the Pekin-Kalgan.

NATIONAL RAILWAYS OF MEXICO.—The General Equipment Company, New York, has sold to The Oliver American Trading Company, Inc., with New York City office at 61 Broadway, 65 rebuilt locomotives, including Mogul, 10-wheel and Consolidation type locomotives for use over the lines of the National Railways of Mexico in connection with the operation of the private freight trains of the Oliver company. This company, in addition to these 65 locomotives just purchased, also has leased within the past few days 20 locomotives from American railroads, which, with the equipment they are now operating, gives it a total motive power of about 95 locomotives. This sale of the General Equipment Company has been made possible by virtue of certain arrangements between Senor Francisco Perez, Director-General of the National Railways of Mexico and The Oliver American Trading Company, Inc., which plan provides a practical means of financing this equipment.

Freight Cars

The LEHIGH VALLEY is asking for prices on repairs on 1,000 box, 500 steel gondola and 500 hopper cars.

BETANZOS FERROL RAILWAY.—Bids will be opened on April 25, at Madrid, Spain, for 94 freight cars of various types.

The UNITED FRUIT COMPANY, New York, has ordered from the General American Tank Car Corporation 2 tank car tanks, to be used on the Truxillo Railway, Honduras.

Iron and Steel

The UNITED STATES STEEL CORPORATION on April 12, announced a change in prices effective April 13, lowering the price on bars from 2.35 cents to 2.10 cents Pittsburgh, and plates and shapes from 2.65 cents and 2.45 cents respectively, to 2.20 cents. It also reduced billets from \$38.50 to \$37; steel brass from \$42 to \$39; wire rods from \$52 to \$48, and tin plates from \$7 to \$6.25 per box.

Track Specialties

THE NORFOLK & WESTERN will receive bids at Roanoke, Va., until 12 o'clock noon, April 20, for 51 kegs of track bolts, 14 switch stands, 5,000 rail bonds, 650 lbs. flux rods, 6 clamps for holding bonds to rail, 8 steel gate posts and 50,800 tie dating nails.

Miscellaneous

MADRID MUNICIPAL RAILWAY.—Bids will be opened on April 25, at Madrid, Spain, for 2,750 tons of steel rails and a large quantity of rails, plates, clamps, screws, ball extractors, and switches.

THE NEW YORK, NEW HAVEN & HARTFORD will receive bids at New Haven, Conn., until 12 o'clock noon, April 22, for its requirements of locomotive and car couplers, to be ordered as required during the period from April 1 to and including December 31, 1921.

Supply Trade News

The **G. M. Basford Company** will remove its office on April 20 from 30 Church street to the National City building, 17 East Forty-second street, New York City.

The **Busch Corporation**, 13 North Seventh street, St. Louis, Mo., has been appointed agent in that territory for the **Track Specialties Company**, 29 Broadway, New York.

The **Rome Iron Mills, Inc.**, will remove its general offices on April 20 from 30 Church street to the National City building, 17 East Forty-second street, New York City.

The **Superheater Company** will remove its general offices on May 1 from 30 Church street to the National City building, 17 East Forty-second street, New York City.

The **Stone Franklin Company** will remove its general offices on April 20 from 30 Church street to the National City building, 17 East Forty-second street, New York City.

The **Franklin Railway Supply Company, Inc.**, will remove its general offices on April 20 from 30 Church street to the National City building, 17 East Forty-second street, New York City.

The **American Arch Company, Incorporated**, will remove its general offices on April 20 from 30 Church street to the National City building, 17 East Forty-second street, New York City.

The **Lima Locomotive Works, Incorporated**, will remove its executive and sales offices on April 23 from 30 Church street to the National City building, 17 East Forty-second street, New York City.

The **International Pulverized Fuel Corporation** will remove its general offices on April 20 from 30 Church street to the National City building, 17 East Forty-second street, New York City.

The **Brown Hoisting Machinery Company**, Cleveland, Ohio, has opened a southern office at 530 Whitney-Central building, New Orleans, La. The states of Texas, Louisiana, Mississippi, Alabama, Georgia and Florida will be covered from this office. **Charles H. White**, who has been with the Brown-hoist company for a number of years, is manager of the new office.

The executive and general sales offices of the **Elliott-Fisher Company** will be removed from Harrisburg, Pa., to New York City early in May. The company will occupy the entire sixteenth floor of the new Canadian-Pacific building, at Madison avenue and Forty-third street, in the Grand Central Terminal zone. The sales offices of the New York City branch have also been removed from 217 Broadway to the same floor of the Canadian Pacific building.

The **National Steel Car Lines Company**, 34 Pine street, New York, has been incorporated with an authorized capitalization of \$1,000,000 preferred stock and 20,000 shares of common stock of no par value, to finance purchases of locomotives and cars. The officers and directors of the company are **Ernest L. Nye**, president; **Leon S. Freeman** and **E. Kirk Haskell**, vice-presidents; **S. Halline**, secretary; **R. J. Burton**, treasurer; **Southgate B. Freeman** and **James A. Cotner**.

The **Engineering Business Exchange** announces the opening of a Southeastern branch with **Marshall O. Leighton**, consulting engineer of Washington, D. C., as director, and with offices in the McLachlen building. Mr. Leighton was for 12 years one of the principal officers of the United States Geological Survey. During the past three years he has served as chairman of the National Service Committee of the Engineering Council and as leader of the national organization which has carried on the campaign to reform the government's business methods and establish a federal department of public works. Mr. Leighton graduated in 1896 from the

Massachusetts Institute of Technology. Associated with Mr. Leighton in carrying on the exchange will be **A. C. Oliphant**, who was also active in the work of the Engineering Council's National Service Committee. Mr. Oliphant is a graduate of Drexel Institute and Columbia University, and was engaged in electric central station work and industrial engineering until he entered the Ordnance Department of the Army during the war.

Page Steel & Wire Company

A. P. Van Schaick, whose appointment as general manager of sales of the Page Steel & Wire Company, with headquarters in the Grand Central Terminal, New York, was announced in the *Railway Age* of April 8, began his business career in 1903, at which time he left Williams College, Williamstown, Mass., to enter the railroad sales department of the Pittsburgh Plate Glass Company, with headquarters in Chicago. From 1906 to 1910 he was in the employ of the Universal Railway Supply Company, with headquarters in the same city, resigning from that position during the latter year to become district sales manager of the Lackawanna Steel Company at Chicago. In May, 1919, he went to the American Chain Company, Inc., Bridgeport, Conn., as special representative, with headquarters in Chicago, and subsequently was appointed assistant general manager of sales of the same company at New York. On January 1, 1921, he was promoted to general manager of sales of the American Chain Company and other subsidiary companies, and now becomes also general manager of sales of the Page Steel & Wire Company. Mr. Van Schaick has been active in the work of railway supply organizations and especially of the National Railway Appliances Association. He was elected a member of the executive committee of this association in 1910, vice-president in 1911, and president the following year.



A. P. Van Schaick

W. T. Kyle, who has been appointed assistant general manager of sales of the Page Steel & Wire Company, was born in 1883, at Baltimore, Md. He was educated in the high schools and took academic courses in various academies, specializing in civil engineering. In 1901 he began an apprenticeship course with the Bell Telephone Company, at Philadelphia, Pa., and two years later went with the American Pipe & Construction Co., Philadelphia, as district superintendent, on general railroad construction work. He left that position in 1908, to go to the Duplex Metals Company, New York, as a salesman, and later became sales manager of the same company. In 1914 he went to the Okonite Company as special representative at New York. In 1916 he entered the service of the Page Steel & Wire Company as sales manager of its Armco wire department at New York,



W. T. Kyle

and on April 1 was promoted to assistant general manager of sales, with headquarters at New York. All the company's general sales are now handled at New York for both the Adrian, Mich., and the Monessen, Pa., plants. Mr. Kyle served in 1917 and 1918 as chairman of the Railway Signal Appliance Association, and is now chairman of the Railway Telegraph & Telephone Appliance Association.

The **E. Horton & Son Company**, Windsor Locks, Conn., has bought the chuck business of the American Company, Hartford, Conn. The American Company has specialized in the manufacture of a 3-jaw geared drill chuck known as the Ellison chuck.

Obituary

H. Kirke Porter, president of the **H. K. Porter Company**, Pittsburgh, Pa., died on April 10, at his home in Washington, D. C. He was born on November 24, 1840, at Concord, N. H., and studied at Newton Theological Institute and at Rochester Theological Seminary. He enlisted with the 45th Massachusetts Volunteers in 1862, and was mustered out of service in July, 1863. Mr. Porter served in the United States Christian Commission during the winter of 1864, and began his business life in 1866, as a member of the firm of Smith & Porter, manufacturing exclusively light locomotives. In 1871 the firm became Porter, Bell & Company.



H. K. Porter

In 1879 it was changed to H. K. Porter & Co., and in 1899 was incorporated under the name of the H. K. Porter Company. During the past 20 years, the firm has been engaged in manufacturing heavy as well as light locomotives. This concern was the first to make compressed air locomotives for mine and general industrial use. Mr. Porter was a member of the 58th Congress from 1903 to 1905.

Robert Alexander Bole, vice-president, director and district sales manager of **Manning, Maxwell & Moore, Inc.**, New York, died on April 2, at the age of 62 in the Schenley Hotel, Pittsburgh, where he made his home. Mr. Bole was widely known in the iron, steel and railroad circles. He was born in Old Allegheny City, and received his education in the Pittsburgh schools. In early life he became identified with the Westinghouse Machine Company and rose from the ranks to secretary of that company. Following his long service with the Westinghouse interests, he became identified with the manufacturing company of Niles-Bement-Pond Company, New York, and resigned from that company to become associated with Manning, Maxwell & Moore, Inc. At the time of his death, he had been identified with the latter company for a period of 26 years.



R. A. Bole

Trade Publications

FROM TREE TO TRADE.—The Long Bell Lumber Company, Kansas City, Mo., has issued a profusely illustrated 48-page booklet under this title which describes the operations incident to the manufacture of lumber. The book is elaborately illustrated with photographs in color of the various steps incident to logging, sawing and distribution of lumber, poles, posts and similar products of wood.

POWER UNITS FOR MOVABLE BRIDGES.—The Norwood-Noonan Company, Chicago, has issued a four-page leaflet illustrating and describing self-contained gasoline engine units and auxiliary appliances, designed and built especially for the operation of movable bridges. The leaflet also contains tables of sizes, weights and other physical proportions of this equipment and a list of railroad structures on which it has been used.

DUST COLLECTING EQUIPMENT.—A four-page bulletin (No. 12) has been issued by the Dust Recovering & Conveying Company, Cleveland, Ohio, which illustrates the development of this form of equipment from the simple cyclone separator to the modern Dracco filter cloth system. The bulletin explains the defects of the original equipment in that it failed to remove the finest particles from the exhausted air and introduced the hazard of explosions resulting from sparks developed by the fan blades striking foreign particles in the air. These defects are eliminated in the modern apparatus.

FREIGHT CARS AND APPLIANCES.—The Canadian Car & Foundry Co., Ltd., Montreal, Canada, has recently issued a series of bulletins describing cars built by the company and some of the specialties manufactured in its plant. The numbers of the bulletins and the subjects are as follows: No. 11, Simplex safety brake head; No. 12, A. R. A. standard D coupler; No. 21, box cars for the Canadian Pacific; No. 22, box cars for the Canadian National Railways; No. 23, composite underframe refrigerator cars for the Canadian National; No. 24, all wood stock cars for the Canadian National; No. 31, cars for foreign service.

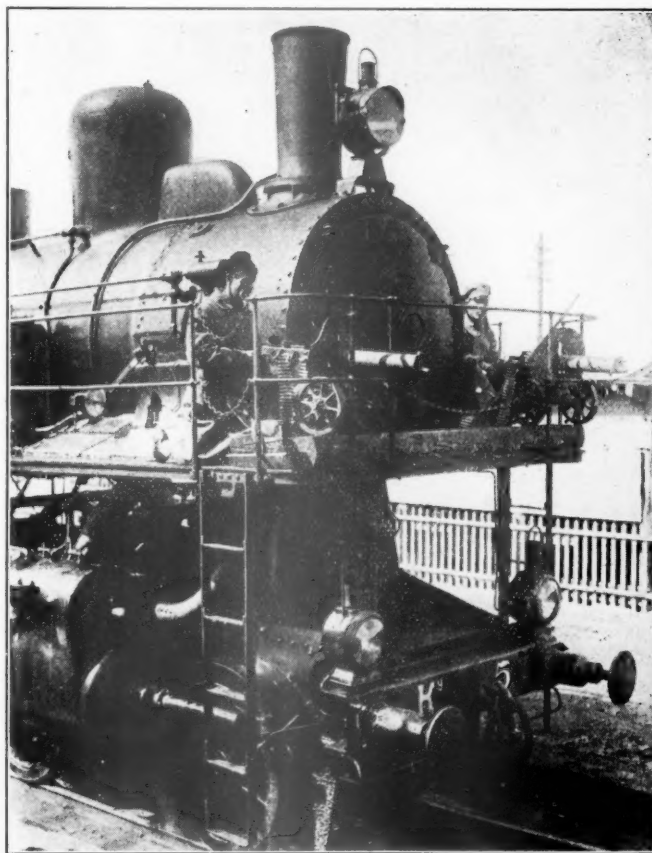


Photo by Keystone

A Locomotive Commandeered by the Bolsheviki

Railway Construction

ATCHISON, TOPEKA & SANTA FE.—This company which was noted in the *Railway Age* of April 1 (page 864) as accepting bids for the construction of a craneway building at Topeka, Kan., to cost approximately \$13,000, has awarded a contract for this work to Joseph E. Nelson & Sons, Chicago.

ATCHISON, TOPEKA & SANTA FE.—This company, in co-operation with the railroad Y. M. C. A. of Topeka, Kansas, will remodel the Y. M. C. A. building at Topeka and build an addition to cost about \$25,000.

CANADIAN NATIONAL.—This company is advertising for bids for the construction of a number of concrete structures in the Ontario district.

CHICAGO UNION STATION.—This company which was noted in the *Railway Age* of April 8 (page 911) as accepting bids for the construction of a new railway mail terminal, has awarded a contract for this work to R. C. Wiebolt, Chicago.

CLEVELAND, CINCINNATI, CHICAGO & ST. LOUIS.—This company contemplates the construction of an engine terminal at Jeffersonville, Ind.

ILLINOIS CENTRAL.—This company, which was announced in the *Railway Age* of March 4 (page 532), as contemplating the construction of a new 100-ft. turntable at Waterloo, Ia., has awarded the contract for this work to the Ellington-Miller Company, Chicago.

ILLINOIS CENTRAL.—This company, which was announced in the *Railway Age* of March 25 (page 821) as accepting bids for the construction of two bridges at Council Hill, Ill., to cost a total of \$60,000, has awarded the contract for this work to the Gould Construction Company, Davenport, Iowa.

INTERSTATE.—This company will shortly ask for bids for the construction of approximately 18 miles of single track line with passing tracks and an interchange yard. The proposed line will lead through mountainous country, and the work will involve the construction of three tunnels.

SEBOOMOOK LAKE & ST. JOHN.—This company which is owned by the Great Northern Paper Company, Boston, has let a contract to J. T. Mullin, Bangor, Me., for the construction of a line 20 miles in length, from Seboomook Lake to St. John Lake, Maine. This line is all through forest land. The maximum gradient will be 2 per cent and the maximum curvature $6\frac{1}{2}$ deg. All bridges will be of wood and there will be one piling trestle 1,100 feet long. A round house and repair shop will be built and some rolling stock and a few locomotives will be purchased, according to the company's announcement.

SPOKANE & BRITISH COLUMBIA.—The Interstate Commerce Commission has issued a certificate authorizing this company to abandon its entire line from Danville to Republic, Wash., 36.3 miles.

TEXAS & PACIFIC.—This company is accepting bids for the construction of bridges across Bayou-Plaquemine, La., and will award the contract for this work on April 20.

WHISTLE FOR CARELESS AUTOMOBILE DRIVERS.—The Chicago & North Western, in its campaign to reduce highway crossing accidents, has sent out a letter to the home address of every engineman on the system and another letter to the home address of each fireman. The attention of the enginemen is called to the heavy toll of lives lost by accidents at crossings and they are directed to be on the alert and to use their whistles more. Specific instances are cited and concrete examples are given of the causes of certain accidents; and it is shown how a continued use of the whistle would have avoided them. The letter to the firemen outlines the crossing accident problem from the firemen's side, directing them to be on the alert and to inform the enginemen of all approaches from their side of the engine.

Railway Financial News

BELT RAILWAY OF CHICAGO.—*New Directors.*—A. E. Wallace and L. W. Baldwin have been elected directors to succeed Mitchell D. Follansbee and A. S. Baldwin, respectively.

BOSTON & MAINE.—*Annual report.*—The corporate income account for the year ended December 31, 1920, compares as follows:

	1920	1919
Operating revenues	\$75,539,327	
Operating expenses	76,346,024	
Net railway operating revenue (loss)	\$806,697	
Tax accruals	2,460,913	
Railway operating income (loss)	\$3,312,291	
Compensation accrued under federal control	1,583,441	\$9,382,527
Amount of certificates issued by the Interstate Commerce Commission account of Guaranty period claim	11,500,690	
Total non-operating income (including other)	\$14,536,286	
Gross income	\$11,223,995	\$8,453,456
Deductions from gross income:		
Hire of freight cars—debit balance	\$3,866,947	
Rent for leased roads	927,845	928,550
Interest on funded debt	5,272,223	3,419,337
Interest on unfunded debt	18,857	1,008,970
Total deductions from gross income inc. other	\$10,609,265	\$5,795,933
Net income	\$614,730	\$2,657,523
Disposition of net income:		
Income applied to sinking funds	410,978	96,559
Dividends (preferred stock)	1,227,948	2,035,716
Equipment trust installments (11½ months proportion)	340,496	
Total appropriations of income	\$1,979,423	\$2,132,275
Net balance transferred to profit and loss—Def.	1,364,693	525,247

The annual report of the Boston & Maine will be reviewed editorially in an early issue.

BUFFALO, ROCHESTER & PITTSBURGH.—*Annual Report.*—The corporate income account for 1920 as compared with 1919 is given as follows:

	1920	1919	Increase or Decrease
Operating income:			
Revenues	\$9,145,766		\$9,145,766
Expenses	7,126,122	\$91,545	7,034,577
Net revenue	\$2,019,644	Def. \$91,545	\$2,111,189
Tax accruals	507,000	99,109	407,891
Uncollectable revenues	47		47
	\$507,047	\$99,109	\$407,938
Total operating income	\$1,512,597	Def. \$190,653	\$1,703,251
Non-operating income:			
Rental—U. S. R. R. Admin.	557,935	3,276,410	—2,718,475
Rental—Guaranty period	1,759,613		1,759,613
Other items	731,440	385,222	346,217
	\$3,048,988	\$3,661,633	—\$612,645
Gross income	\$4,561,586	\$3,470,979	\$1,090,606
Deductions:			
Rentals of leased lines, interest, etc.	2,235,825	2,407,012	—171,187
Net income	\$2,325,760	\$1,063,967	\$1,261,793
Appropriations:			
Pensions and fire insurance funds	30,711	28,602	2,109
Surplus available for dividends	\$2,295,049	\$1,035,366	\$1,259,684
Return on capital stock	13.91 per cent.	6.27 per cent.	7.64 per cent.

The annual report of the Buffalo, Rochester & Pittsburgh will be reviewed editorially in an early issue.

CAPE GIRARDEAU NORTHERN.—*Application for Loan Denied.*—The Interstate Commerce Commission has denied the application of this company for a loan of \$250,000 for the purpose of meeting maturing indebtedness, providing itself with equipment and additions and betterments, on the ground that its prospective earning power does not offer sufficient security.

CHICAGO, BURLINGTON & QUINCY.—*Hearing on Great Northern.*—*Northern Pacific Bonds.*—See article on another page of this issue.

CHICAGO, INDIANAPOLIS & LOUISVILLE.—*Annual report.*—The condensed corporate income account for 1920 is given as follows:

	1920	1919	Increase or decrease
Gross operating revenues.....	\$13,611,131	\$13,611,131	\$13,611,131
Total operating revenues.....	13,210,542	\$65,719	13,144,824
Net operating revenues.....	\$400,588	Dr. \$65,719	\$466,307
Taxes, etc.	492,431	16,744	475,687
Net operating deficit.....	\$91,842	\$82,462	\$9,380
Other income	133,907	109,505	24,401
Standard return	270,000	1,620,000	—\$1,350,000
Guaranty U. S. Government.....	815,249	.....	815,249
Total other income.....	\$1,219,156	\$1,729,505	—\$510,350
Total gross income.....	1,127,313	1,647,043	—\$519,730
Deductions from total gross income for fixed charges including interest on funded debt.....	2,261,207	1,203,384	\$1,057,822
Balance of deficit carried to debit of profit and loss.....	\$1,133,893	.....	\$1,577,552
Balance of income, over charges, carried to credit of profit and loss.....	.....	\$443,659	.....
Dividends declared	370,223	199,652	170,571
Surplus (debit).....	\$1,504,117	.....	\$1,748,123
(credit).....	.....	\$244,007	.....

The operating revenues and expenses in detail and the principal traffic statistics for 1920 compare with 1919 as follows:

OPERATING REVENUES			
	1920	1919	
Freight	\$9,459,004	\$8,366,515	
Passenger	2,952,344	2,891,919	
Total operating revenues.....	\$13,611,131	\$12,355,827	
OPERATING EXPENSES			
Maintenance of way and structures.....	\$1,986,341	\$1,464,707	
Maintenance of equipment.....	4,030,894	3,304,501	
Traffic expenses	321,141	172,144	
Transportation expenses	6,336,517	5,384,032	
General expenses	361,731	314,946	
Total operating expenses.....	\$13,210,542	\$10,764,781	
Net revenue from railway operations.....	\$400,588	\$1,591,046	
Railway tax accruals.....	465,064	494,840	
Railway operating income.....	Def. \$91,842	\$1,094,704	
PASSENGER TRAFFIC			
Number of passengers carried.....	2,202,426	1,991,204	
Number of passengers carried one mile.....	116,889,061	106,166,134	
Average distance hauled per passenger (miles).....	53.07	53.32	
Average receipts per passenger per mile (cents).....	2.896	2.724	
FREIGHT TRAFFIC			
Number of tons carried.....	7,519,803	5,759,540	
Number of tons carried one mile.....	1,143,743,829	770,284,023	
Average distance hauled per ton (miles).....	152.10	133.74	
Average receipts per ton per mile (cents).....	.986	1.086	
Average number of tons of freight in each train.....	601.18	536.63	
Average number of tons of freight in each loaded car	29.08	25.18	

President H. R. Kurrie in his remarks refers to maintenance as follows:

Cross ties renewed during the year was 160,486 as compared with 82,702 in the previous year. New 90 lb., section steel rail laid, replacing light rail was 2,917 tons, compared with 5,215 tons last year. New ballast placed in track was 165,669 cubic yards, as compared with 71,151 cubic yards, last year. In equipment maintenance, the average cost per locomotive repaired, excluding renewals and depreciation, was \$12,796, as compared with \$10,034. The average cost of repairs per passenger train car was \$2,832, as compared with \$1,643 in the previous year. Cost of repairs per freight train car excluding renewals and depreciation was \$279, as compared with \$160 last year. The difference in the cost of repairs to equipment arises from increased wages and more complete repairs.

CHICAGO JUNCTION.—*Hearings on Acquisition by New York Central.*—See New York Central.

CHICAGO, ROCK ISLAND & PACIFIC.—*Annual Report.*—A review of this company's annual report for 1920 appears on another page of this issue.

CHICAGO & NORTH WESTERN.—*New director.*—Marshall Field has been elected a director to succeed James Stillman, resigned.

CHICAGO & WESTERN INDIANA.—*Annual Report.*—The annual report for the year ended December 31, 1920, shows a net income for the year of \$516,411. The income account for the year 1920 compares as follows:

	1920	1919
Total operating revenue	\$233,828	
Operating expenses	418,223	
Net operating loss	184,395	
Compensation from U. S. Government.....	317,875	\$1,880,737
Joint facility rent income	1,930,586	
Income from lease of road	1,980,167	1,863,943
Total non-operating income inc. other.....	4,444,485	
Gross income	4,260,090	3,881,290
Interest on bonds	2,365,000	3,071,953
Interest on unfunded debt.....	814,776	
Total deductions from gross income, inc. other....	3,743,679	3,490,114
Net income for year	\$516,411	391,177

OPERATING EXPENSES

	1920	1919	Increase or Decrease
Maintenance of way and structures.....	\$805,937	\$585,366	\$220,571
Maintenance of equipment	366,043	265,998	100,045
Traffic expense	3,492	3,346	146
Transportation expense	1,857,073	1,351,286	505,787
General expense	158,511	159,900	1,388
Total	\$3,202,932	\$2,379,164	\$823,769

The report in speaking of maintenance says:

The expense incident to maintenance of way and structures increased \$220,571, or 37.7 per cent, practically all of which was due to the increased wage rates granted in Decision No. 2 of the United States Railroad Labor Board effective May 1, together with the increased cost of materials. The total man-hours for the year in this department reflect a decrease of 3 per cent as compared with the man-hours worked in 1919 and approximately 40 per cent as compared with 1918.

Maintenance of equipment expense increased \$100,045, or 37.6 per cent, and as in the case of the maintenance of way department the increase was principally due to the higher wage rates made effective May 1 by the United States Railroad Labor Board Decision No. 2, as well as the higher cost of materials needed for the repair of locomotive and car equipment.

Transportation expense increased \$505,786, or 37.4 per cent, and was principally due to the higher wage rates for all classes of employees made effective May 1 by United States Railroad Labor Board Decision No. 2, also the higher cost of materials.

The strike of the switchmen, which went into effect April 4, and which was not formally declared off until September 13, also contributed to the increased cost of operation in the transportation department.

The work of this department also increased during the year as evidenced by the fact that the number of passenger trains at the beginning of the year numbered 119 per day, whereas at the end of the year a total of 125 passenger trains were handled in and out of Dearborn Station per day.

New Directors.—A. E. Wallace and Mitchell D. Follansbee have been elected directors.

ERIE.—*Annual Report.*—The corporate income account for 1920 as compared with 1919 shows results as follows:

	1920	1919
Compensation accrued under federal control, January and February	\$2,630,861	
Guaranty, March 1 to August 31.....	7,892,563	
Net railway operating income, September 1 to December 31	3,288,620	
Total compensation, etc.	13,812,044	\$15,841,263
Total non-operating income	4,704,919	4,569,998
Gross income	18,516,983	20,411,261
Total deductions from gross income.....	14,078,397	14,284,156
Net income	4,438,586	6,127,104
Applied to sinking and other reserve funds.....	976,015	1,005,000
Balance for year	3,462,570	5,122,104

The annual report of the Erie will be reviewed editorially in an early issue.

GULF PORTS TERMINAL COMPANY.—*Asks Authority to Issue Bonds.*—This company has applied to the Interstate Commerce Commission for authority to issue \$300,000 of first mortgage, 5 year, 8 per cent bonds to finish the uncompleted line to Mobile, Ala., a distance of 7 miles.

GRAND TRUNK.—*Defaults Bond Interest.*—This company has defaulted interest payments due April 1 on one of its bond issues floated in London.

The Canadian Government has informed the Grand Trunk that it must turn over possession and control of the lines to the government to gain consideration of its application for further advances and an extension of time in the arbitration proceedings now pending on the physical value of the road.

LOUISVILLE & NASHVILLE.—*Annual Report.*—A review of this company's annual report for 1920 appears on another page of this issue.

NASHVILLE, CHATTANOOGA & ST. LOUIS.—*New Director.*—J. J. Gray, Jr., has been elected a director.

NEW YORK CENTRAL.—*Hearings on Acquisition of Chicago Junction Railway.*—The hearings before W. H. Colston, director of the division of finance of the Interstate Commerce Commission, upon the application of the New York Central for authority to acquire the terminal properties of the Chicago Junction and the Chicago River & Indiana, were adjourned on April 9 and another session of hearings is to start in three weeks. Testimony brought out during the last days of the first hearing concerned the financial condition of the properties and statements of shippers who are in favor of the purchase of the line by the New York Central. It was stated by L. D. Porter, assistant comptroller in charge of accounts of the New York Central, that the total annual switching revenue for the two belt roads in the year 1917 and 1918 was \$7,701,000. In 1920 the Chicago Junction showed a deficit of \$199,192 and the Chicago River & Indiana an income of \$432,228. The latter figure, it was shown, represents about 86 per cent re-

turn on the capital stock of \$500,000 and about 57½ per cent return on the \$750,000 investment the New York Central proposes to make to acquire the road. The total net on the two roads of \$232,000 is about 40 per cent. Other evidence introduced showed the car movement in tonnage, in different classes of freight handled by the Junction. A detailed analysis of the destination of such freight by roads in commodities was called for by Luther M. Walter.

Several witnesses for the New York Central testified the purchase would be advantageous to the shippers. When the hearings are again started shippers who oppose the purchase, it is claimed, will seek to show that the petitions signed by 98 per cent of the shippers on the Chicago Junction property favoring the New York Central plan, were obtained by representing to them that the Belt line was in such shape as to face imminent receivership and that it would shortly be operated by a receiver with a corresponding effect on service. Attorney Ballard, for the opposing shippers, declared he would produce testimony to show that the Junction net work of city tracks must be kept open to all roads or serious consequences to shippers will result.

NORTHERN PACIFIC.—Annual Report.—The corporate and federal income account for 1920 as compared with 1919 shows results as follows:

	1920	1919	Increase or Decrease
Operating income:			
Operating revenues	\$113,084,468	\$100,739,354	\$12,345,054
Operating expenses	100,983,874	78,672,509	22,311,365
Net operating revenue.....	\$12,100,534	\$22,066,845	—\$9,966,311
Tax accruals	10,108,686	9,000,737	1,107,949
Uncollectable railway revenues	18,469	23,940	—5,471
Total operating income	\$1,973,378	\$13,042,167	—\$11,068,789
Total operating income, inc. other	14,358,569	10,866,140	3,492,429
Compensation	5,301,309	30,089,692	—24,788,383
Guaranty under federal control act	14,760,606	.....	14,760,606
Deduct, federal income included above	*4,002,970	*18,353,597	14,350,627
Gross corporate income.....	\$32,390,893	\$35,644,402	—\$3,253,509
Total deductions from gross income	13,558,634	13,880,509	—321,876
Less federal deductions	*261,924	*1,072,844	810,920
Net deductions	\$13,296,709	\$12,807,665	\$489,044
Net corporate income	\$19,094,183	\$22,836,737	—\$3,742,553
Disposition of net income:			
Dividend appropriations of income	17,360,000	17,360,000	
Income balance for year—transferred to profit and loss	\$1,734,183	\$5,476,737	—\$3,742,553

*In arriving at "Gross income," federal items for 1919 amounting to \$18,353,597 and in 1920 to \$4,002,970 have been added to corporate items. In arriving at "Total deductions from gross income," federal items for 1919 amounting to \$1,072,844 and for 1920 to \$261,924 have been added to corporate items. In order to arrive at the correct "Income balance" for each year it has been necessary to deduct from "Gross income" and "Total deductions from gross income" the amounts shown above.

The annual report of the Northern Pacific will be reviewed editorially in an early issue.

READING COMPANY.—To Hear Intervening Petitions.—Joseph E. Widener, a director of the Reading Company, has withdrawn his power of attorney given the Prosser common stockholders' committee and has presented a petition to the Federal District Court at Philadelphia to intervene in the matter of the segregation of the Reading Company properties, together with a separate answer to certain intervening petitions and cross petitions. The estate of P. A. B. Widener holds 100,000 shares of Reading common. Mr. Widener approves the plan as originally presented by the Reading Company, but desires to register a disclaimer and protest with respect to the "attempt of certain intervening interests to obtain a construction of the basic contracts between the different classes of stockholders of the Reading Company."

Federal Judge J. Whitaker Thompson at Philadelphia on April 13 set May 2 for argument in the United States Court of Appeals in the matter of the segregation of the Reading company properties as decreed by the United States Supreme Court. The court allowed eleven parties in interest in the case to file intervening petitions.

TENNESSEE CENTRAL.—Hearing on Order of Sale Postponed.—Judge E. T. Sanford in the federal court at Nashville, Tenn., on April 4, decided to postpone the order of sale for a hearing in Chattanooga on May 2.

VALDOSTA, MOULTRIE & WESTERN.—Foreclosure Sale.—This road, operating between Valdosta, Ga., and Moultrie, 42 miles, was sold at foreclosure on April 9 to Charles L. Jones, who put in a bid of \$87,000 for the stockholders. The road has been in the hands of receivers since November 5, 1920.

WATERLOO, CEDAR FALLS & NORTHERN.—Loan from revolving fund approved.—The Interstate Commerce Commission has approved a loan of \$1,260,000 to this company to assist it in meeting maturing indebtedness.

WESTERN PACIFIC.—Hearing on Application to Issue Securities.—The Interstate Commerce Commission has announced a hearing to be held at Washington on April 25 on the application of the Western Pacific for authority to issue \$4,180,000 of first mortgage bonds and of the Denver & Rio Grande Western to issue 300,000 shares of its common stock without par value.

WICHITA FALLS & NORTH WESTERN.—Authorized to Issue Receiver's Certificates.—The receiver has been authorized by the Interstate Commerce Commission to issue receiver's certificates in an amount not exceeding the indebtedness of the applicant to the United States arising out of federal control and to pledge the certificates with the director general of railroads as collateral security for notes by which the funding of the indebtedness shall be accomplished. A tentative statement of account shows a balance of \$311,816 due to the director general.

Guaranty Certificates Issued

The Interstate Commerce Commission has issued the following certificates for partial payments on account of the railroad guaranty for the six months following federal control:

		Previously paid
Big Fork & International Falls.....	\$25,000	
Gainesville Midland	25,000	\$4,300
Georgia, Florida & Alabama	40,000	90,000
Montana Western	3,000	
Knoxville, Sevierville & Eastern	9,540	
Mobile & Ohio	375,000	950,000
Minneapolis, St. Paul & Sault Ste. Marie.....	1,400,000	3,135,000
Minnesota & International	150,000	
Gulf, Florida & Alabama	370,000	200,000
Appalachicola Northern	38,000	
Atlantic Coast Line	2,400,000	2,500,000
Nashville, Chattanooga & St. Louis	150,000	1,200,000
Texas Midland	100,000	
Western Allegheny	45,000	
Georgia Northern	4,000	
Wadley Southern	50,000	
Sylvania Central	10,000	
Central of Georgia	475,000	2,450,000
Pittsburgh & Lake Erie	3,000,000	

The MISSOURI-ILLINOIS RAILROAD, operating between Oakdale, Ill., and Kellogg, and between Little Rock, Mo., and Bismarck, resumed train service on Saturday, March 26, with mixed trains.



Photo by Keystone

Prince of Wales Inspecting Guard of Honor, Portsmouth, England

Railway Officers

Executive

Robert L. Russell, freight traffic manager of the Philadelphia & Reading, with headquarters at Philadelphia, has been elected vice-president in charge of traffic, effective April 11,



R. L. Russell

succeeding E. B. Crosley, deceased. Mr. Russell was born in Howard county, Maryland, July 19, 1867. He began his railroad career in October, 1882, as a clerk for the Baltimore & Ohio, at Baltimore. Subsequently he was employed as a clerk with the Philadelphia & Reading Express Company, the Adams Express Company, the Woodruff Parlor Car Company, and the Long Island. He entered the service of the Philadelphia & Reading as a clerk in the transportation department at Philadelphia in October,

1887. He was transferred to the general freight office in March, 1888, and became chief clerk of that department in June, 1891. He was promoted to freight claim agent in April, 1894, and to assistant general freight agent in June, 1907. In December, 1909, he was appointed general freight agent, and in July, 1918, he was appointed assistant freight traffic manager of the Philadelphia & Reading; the Central of New Jersey, the Staten Island Rapid Transit, and the Baltimore & Ohio New York terminals. In December of the same year he was made freight traffic manager of the same roads. Upon the return of the railroads to private control on March 1, 1920, Mr. Russell was appointed freight traffic manager of the Philadelphia & Reading.

Ross Beason, whose election to vice-president of the Salt Lake & Utah, with headquarters at Salt Lake City, Utah, was announced in the *Railway Age* of March 25 (page 822), was



R. Beason

born on February 19, 1887, at Birmingham, Ala. He entered railway service in April, 1907, as a rate clerk in the freight offices of the Southern at Mobile, Ala. In 1908 he was employed as rate clerk in the division freight offices at Selma, Ala., and in 1909 was made chief clerk in the same office. During the same year Mr. Beason was transferred to Memphis, Tenn., as chief quotation clerk in the general freight offices. In 1910, he was promoted to chief clerk in the commercial office at Memphis. A year later he was made traveling freight

agent, with headquarters at Huntsville, Ala., but in 1912 he left railroad service on account of ill health. He re-entered railroad work in 1913 as traveling freight agent on the Chicago, Rock Island & Pacific, with headquarters at Salt Lake

City, Utah. In January, 1914, he organized the Traffic Service Bureau of Utah at Salt Lake City, and remained with that organization until November, 1914, when he was appointed traffic manager of the Salt Lake & Utah Railroad, which was then under construction. He was serving in that position at the time of his election as vice-president. During the past three years Mr. Beason has spent considerable time in Washington, D. C., with the American Short Line Railroad Association, of which organization he has been a member of the Committee on Legislation and the Western Freight Rate Committee.

H. C. Nutt has been elected president of the Monongahela, with headquarters at Pittsburgh, Pa., effective April 4. **J. A. McCrea** and **J. B. Yohe** have been appointed vice-presidents of the company.

E. R. Oliver, freight traffic manager of the Southern, Lines West, has been elected vice-president, with headquarters at New Orleans, effective April 15. Mr. Oliver was born in La Fayette county, Miss., February 25, 1883. He was educated in the public schools, and was graduated from the Jefferson Law School, Louisville, Ky., with the degree of LL. B. in 1910. Mr. Oliver began his railroad career in 1898 as a clerk in the traffic department of the Southern. He held various positions in that department until January, 1906, when he was appointed traveling freight agent at Chicago. The following year he was promoted to soliciting freight agent at Louisville. In 1910 Mr. Oliver was appointed chief clerk to the assistant freight traffic manager and, in 1912, to assistant general freight agent at Louisville, Ky. On January 1, 1916, he was transferred in a similar capacity to Washington, D. C., and on October 1 of the same year to Atlanta, Ga. He was promoted to general freight agent in Cincinnati in March, 1920, and to freight traffic manager in January, 1921. He was occupying this position at the time of his recent promotion.

Financial, Legal and Accounting

T. E. Trigg has been appointed auditor of the Christie & Eastern and the Kinder & Northwestern, with headquarters at Shreveport, La.

J. N. Ford, auditor of capital accounts of the Chicago, Rock Island & Pacific, with headquarters at Chicago, has resigned, effective April 9, to become associated with the Allied Dye & Chemical Corporation, New York City.

Operating

J. S. Adsit, general agent on the Chicago, Milwaukee & St. Paul, with headquarters at Kansas City, Mo., has been promoted to general southwestern agent, with the same headquarters, effective March 22.

W. K. Etter, assistant general manager on the Atchison, Topeka & Santa Fe, Western district, with headquarters at Topeka, Kan., has been promoted to assistant to the vice-president in charge of operation, with headquarters at Chicago, Illinois, effective April 11, succeeding **F. A. Lehman**, who has been promoted to the position of general manager, Western lines.

A. M. Umshler has resumed his duties as terminal superintendent on the Illinois Central, with headquarters at Chicago, effective April 10. Mr. Umshler, who has been on leave of absence, succeeds **A. Bernard**, who has been appointed superintendent of passenger service, with headquarters at Chicago. Mr. Bernard succeeds **D. E. Hilgartner**, who has been appointed passenger service inspector of the Illinois Central system.

E. W. Scheer has been appointed general manager, Eastern Lines, of the Baltimore & Ohio with headquarters at Baltimore, Md., effective April 15, succeeding Stanton Ennes, who resigned on January 1. **R. B. White**, superintendent of the Baltimore division, has been appointed general superintendent of the Maryland district with headquarters at Baltimore, succeeding Mr. Scheer. **F. G. Hoskins**, superintendent of the

Baltimore Terminal division, has been appointed superintendent of the Baltimore division, succeeding Mr. White.

Coincident with the reorganization of the operating forces of the Michigan Central, effective March 14, **B. H. Winans**, assistant superintendent, with headquarters at Detroit, Mich., has been appointed trainmaster, with the same headquarters. **L. J. Robbins**, trainmaster, North Toledo yard, has been transferred to Junction yards, Detroit, Mich. **F. McElroy**, trainmaster, Windsor, Ont., has been transferred to St. Thomas, Ont. **E. Holst**, trainmaster, North Toledo yard, has been appointed general yardmaster. **E. C. Beckwith**, **A. D. Williams** and **E. D. Heingway**, trainmasters at Detroit, have been appointed general night yardmasters. **E. J. Tallman**, trainmaster at North Lansing, Mich., has been appointed yardmaster at Saginaw, Mich. **G. W. Kemp**, trainmaster at Detroit, has been appointed assistant yardmaster. **T. J. Keenan**, assistant trainmaster at Chicago, has been appointed chief clerk to division superintendent. **W. B. Gibbs**, trainmaster with headquarters at Chicago, has been granted a leave of absence. The position of trainmaster and assistant trainmaster at Chicago have been abolished. The following trainmasters have been assigned to other duties: **G. L. Prehn**, Grayling, Mich.; **J. Purvis**, St. Thomas, Ont.; **A. R. Bailey**, Detroit; **C. G. Campbell**, Detroit; **J. A. Fahey**, Jackson, Mich.

F. A. Lehman, assistant to the vice-president in charge of operation of the Atchison, Topeka & Santa Fe, with headquarters at Chicago, has been promoted to general manager, Western lines, with headquarters at Amarillo, Texas, effective April 6, succeeding R. J. Parker, deceased. Mr. Lehman was born on May 31, 1871, at Masthope, Pa., and entered railway service in August, 1888, as a telegraph operator on the Atchison, Topeka & Santa Fe. In May, 1890, he was made clerk in the maintenance of way department and in January, 1891, he was promoted to chief clerk in the trainmaster's office. From November, 1891, to May, 1892, he served as telegraph operator and dispatcher and on the latter date returned to the maintenance of way department as chief clerk. In May, 1900, Mr. Lehman was made clerk in the office of the vice-president in charge of operation, with headquarters at Chicago, and seven years later was promoted to superintendent of transportation, with the same headquarters. In April, 1909, he was promoted to assistant to the vice-president and served in that capacity until November, 1914, when he was appointed acting general superintendent, with headquarters at Newton, Kan. In May, 1915, he returned to his position as assistant to the vice-president and was serving in that capacity on the advent of federal control. In July, 1918, he was appointed assistant to the federal manager, which position he held until March, 1920, when he resumed his duties as assistant to the vice-president in charge of operation.

A. A. Miller, whose appointment as superintendent of the Missouri division of the Missouri Pacific, with headquarters at Poplar Bluff, Mo., was announced in the *Railway Age* of April 1 (page 869), was born at Zanesville, Ohio, on September 28, 1879, and was educated at Ohio State University, graduating in 1902. He entered railway service in June, 1902, as a rodman on the Baltimore & Ohio at Wheeling, W. Va., and during the next five years served successively as assistant division engineer, with headquarters at Cleveland, Ohio; as assistant engineer at Baltimore, Md., and as division engineer with headquarters at Philadelphia, Pa. In September, 1907,

he accepted an appointment as chief engineer with the West Coast Company at Los Angeles, Cal., but returned to railroad service in June, 1909, as assistant engineer on the Missouri Pacific, with headquarters at St. Louis, Mo. In June, 1911, he was promoted to division engineer with headquarters at Kansas City, Mo., and in June, 1912, was transferred to Poplar Bluff, Mo. Five years later he was promoted to district engineer, with headquarters at Little Rock, Ark. At the time of his recent appointment, Mr. Miller was serving as district engineer with headquarters at Kansas City, Mo., where he had been transferred in August, 1918.

The following changes have taken place on the Northwestern Region of the Pennsylvania coincident with the abolishment of the Northern Ohio division and the consolidation of the Mansfield and Fort Wayne divisions, effective March 16: **J. B. Hutchinson**, junior general superintendent of the Northern Ohio and Mansfield divisions, has been appointed general superintendent of the Toledo division with headquarters at Toledo, Ohio. **Paul Jones**, superintendent, with headquarters at Toledo, has been transferred to the Grand Rapids division with headquarters at Ft. Wayne, Ind., succeeding **G. R. Barry** who has been appointed division engineer with headquarters at Logansport, Ind. **T. A. Roberts**, superintendent, with headquarters at Mansfield, O., has been appointed acting superintendent of the Ft. Wayne division with headquarters at Ft. Wayne, succeeding **B. H. Hudson**, transferred to Logansport, Ind. Mr. Hudson has succeeded **C. B. Reynolds** who has been appointed trainmaster with the same headquarters. Mr. Reynolds has in turn succeeded **G. W. Bradley** who has been appointed assistant trainmaster. **C. L. Hamilton**, superintendent of transportation, with headquarters at Chicago, has been appointed assistant superintendent of the Ft. Wayne division. The office of superintendent of transportation at Chicago has been abolished.

Traffic

F. W. Ditman has been appointed commercial agent on the Hocking Valley, with headquarters at Detroit, Mich.

W. E. Burnett, Jr., has been appointed commercial agent on the Norfolk & Western, with headquarters at Fort Worth, Texas.

R. H. Snead, assistant to the president of the Chesapeake & Ohio, has been appointed manager of mail and express traffic, effective April 1.

M. Broadus has been appointed commercial agent of the Norfolk & Western, with headquarters at St. Louis, Mo., effective April 1.

F. L. Maher has been appointed district freight and passenger representative on the Baltimore & Ohio, with headquarters at Seattle, Wash.

T. J. Shelton has been appointed general freight agent of the Christie & Eastern and the Kinder & Northwestern, with headquarters at Shreveport, La.

M. S. Throne has been appointed general agent, freight department, of the Canadian Pacific with headquarters at New York. **F. T. Goodman** has been appointed district freight agent with headquarters at Philadelphia, Pa.

A. M. Dudley, division freight agent on the Chesapeake & Ohio, with headquarters at Cincinnati, Ohio, has been promoted to general Western freight agent, with the same headquarters. **Hilliard Russell** has been appointed commercial agent, with headquarters at Nashville, Tenn.

V. C. Baughn, traffic representative on the Detroit, Toledo & Ironton, with headquarters at Ironton, Ohio, has been promoted to commercial agent, with headquarters at Detroit, Mich., succeeding **W. G. Howard**, who has been transferred to Pittsburgh. **L. H. Welch** succeeds Mr. Baughn.

H. C. Stauffer, general coal freight agent of the Philadelphia & Reading, with headquarters at Philadelphia, has been appointed general freight agent with the same headquarters,



F. A. Lehman

effective April 11, succeeding E. D. Hilleary, promoted. **J. W. Hewitt**, division freight agent, Reading Terminal, Philadelphia, has succeeded Mr. Stauffer.

C. S. Morse, district freight agent of the Canadian Pacific with headquarters at London, Ont., has been transferred to a similar position with headquarters at Toronto, succeeding **W. B. Bamford**, who has been transferred in a similar capacity to Nelson, B. C. **H. G. Buchanan** has succeeded Mr. Morse at London. **R. W. Chateauvert** has been appointed chief of the tariff bureau with headquarters at Montreal, succeeding R. J. Hunt.

J. H. Carey has been appointed district freight agent on the Canadian Pacific, with headquarters at Memphis, Tenn. **C. P. McGhee** has been appointed district freight agent with headquarters at Los Angeles, Cal. **J. H. Fox** has been appointed district freight agent with headquarters at Edmonton, Alta. **J. Halstead**, district freight agent, with headquarters at Calgary, Alta., has been transferred to Winnipeg, Man., succeeding **A. T. McKean**, who has been transferred to Calgary.

Edgar D. Hilleary, general freight agent of the Philadelphia & Reading, with headquarters at Philadelphia, has been appointed freight traffic manager, with the same headquarters,



E. D. Hilleary

effective April 11, succeeding R. L. Russell, promoted. Mr. Hilleary was born in Frederick county, Maryland, on September 1, 1877. He is a graduate of St. John's College, Annapolis, Md., of the class of 1897, and holds the degree of Bachelor of Science. He entered the service of the Philadelphia & Reading as a clerk in the office of the foreign freight agent at Philadelphia on July 1, 1897. In the same year he entered the office of the assistant general freight agent in charge of export and import traffic. Later he was appointed chief clerk of this department, and in June, 1905, he was appointed agent of the Central States Despatch Fast Freight Line at Philadelphia, and in January, 1906, was promoted to division freight agent of the New York division and the Atlantic City Railroad. On February 14, 1910, he was appointed division freight agent at Harrisburg; on December 1, 1918, assistant general freight agent; and on March 1, 1920, general freight agent, which position he held until his appointment as freight traffic manager.

F. S. Riegel, assistant general freight agent on the Southern, with headquarters at Cincinnati, Ohio, has been promoted to general freight agent, with the same headquarters. **W. Humphrey** has been appointed general Western freight agent, with headquarters at Chicago. **J. P. Tocher** has been appointed division freight agent, with headquarters at Louisville, Ky. **J. N. Templeton** has been appointed division freight agent, with headquarters at Lexington, Ky. **W. T. Keating** has been appointed commercial agent, with headquarters at Indianapolis, Ind. The promotions and appointments are effective April 15.

J. W. Bray, division freight agent of the Southern with headquarters at Greensboro, N. C., has been appointed assistant general freight agent with headquarters at Atlanta, Ga., succeeding **G. H. Kerr**, who has resigned to become traffic manager of the Southeastern Express Company. **P. A. Wright** has been appointed assistant general freight agent in charge of solicitation with headquarters at Atlanta, Ga. **Hamilton Baxter** has been appointed division freight agent with

headquarters at Norfolk, Va., succeeding **W. T. Turner**, who has been transferred to Greensboro, N. C., to succeed Mr. Bray, promoted. **E. R. Gardner** has been appointed commerce agent with headquarters at Washington, D. C. These appointments were effective March 15.

G. H. Kerr, assistant general freight agent of the Southern with headquarters at Atlanta, Ga., has resigned to become traffic manager of the Southeastern Express Company with headquarters in the same city. Mr. Kerr was born at Homer City, Pa., December 4, 1878, and was educated in the public schools. He entered railway service in 1900 as a clerk in the freight office of the Pennsylvania at Bessemer, Pa. In 1905 he became a rate clerk in the division freight office at Pittsburgh, Pa. He was appointed traveling freight agent for the Eastern & Southern Despatch in 1907 and, in 1909, agent for the Despatch at Pittsburgh. In 1913 he became a commercial agent for the Southern with headquarters at Pittsburgh and, the following year, he was transferred in a similar capacity to Atlanta, Ga. In 1917 he was promoted to assistant general freight agent, which position he held until he resigned to enter upon his present duties.



G. H. Kerr

Stuart A. Allen, whose promotion to freight traffic manager of the Baltimore & Ohio, Western lines, with headquarters at Chicago, was announced in the *Railway Age* of March 25

(page 822) was born at Oral Oaks, Va., on January 18, 1873. He was educated at the University School, Petersburg, Va., and at the United States Military Academy, West Point, N. Y., and entered railway service in 1891, as a clerk in the offices of the Savannah, Florida & Western at Gainesville, Fla. In 1892, he was employed by the Savannah, Americus & Montgomery in the clerical department at Americus, Ga., and in 1893 he became a clerk on the Central of Georgia at Albany, Ga. In 1894, he was appointed traveling freight and



S. A. Allen

passenger agent on the Knoxville, Cumberland Gap & Louisville, with headquarters at Knoxville, Tenn., and in 1896 was made traveling freight agent on the Cincinnati, Hamilton & Dayton, now part of the Baltimore & Ohio system, with headquarters at Cincinnati, Ohio. He was promoted to general agent on the same road in 1898 and two years later was made general southern agent, retaining his headquarters at Cincinnati. In 1904, Mr. Allen was made southern agent at Cincinnati, and in 1907 was promoted to general southern freight agent. Three years later he was again promoted, becoming assistant general freight agent of the Cincinnati, Hamilton & Dayton, and in 1912 he was made general agent on the Baltimore & Ohio, retaining his headquarters at Cincinnati. After two years of service in this position, he was made manager of the

Baltimore & Ohio Fast Freight Line, the Continental Line and the Central States Dispatch, at Cincinnati. He was promoted to general eastern freight agent on the Baltimore & Ohio and transferred to New York in 1916, and in 1917, he was made general freight agent, with the same headquarters. At the time of his recent promotion, Mr. Allen was serving as assistant freight traffic manager, with headquarters at New York, to which he had been promoted in 1920.

Mechanical

J. F. Speigle has been appointed assistant master mechanic on the Canadian National, with headquarters at Hornepayne, Ont., succeeding W. G. Strachan, who has been transferred to Capreol, Ont.

O. P. Reese, superintendent of motive power of the Pennsylvania, Northwestern Region, with headquarters at Toledo, has been transferred to Chicago, succeeding **O. C. Wright**, assigned to other duties.

G. T. De Pue, mechanical superintendent of the Erie, with headquarters at Chicago, has been appointed shop superintendent at Galion, Ohio, effective April 1. The office of mechanical superintendent at Chicago has been abolished.

Engineering, Maintenance of Way and Signaling

F. P. Sisson, division engineer of the Grand Trunk, with headquarters at Detroit, Mich., has been transferred to a similar position at Chicago.

C. W. Johns, engineer of construction of the Chesapeake & Ohio, has taken over, without change of title, the duties of **F. I. Cabell**, chief engineer, retired, effective April 1.

J. R. Sexton, regional engineer of the Erie, with headquarters at Chicago, has been appointed division engineer at Huntington, Ind., effective April 1. The office of regional engineer at Chicago has been abolished.

C. T. Jackson, principal assistant engineer of the Chicago, Milwaukee & St. Paul, with headquarters at Chicago, has been appointed district engineer of the Southern district, with the same headquarters, effective April 16, succeeding **D. C. Fentemaker**, who has been granted a leave of absence.

D. S. Farley, division engineer of the Atchison, Topeka & Santa Fe, with headquarters at Dodge City, Kan., has been promoted to assistant general manager, Western district, with headquarters at Topeka, Kan., effective April 11, succeeding **W. K. Etter**, appointed assistant to vice-president.

In connection with the abolishment of the Northern Ohio division of the Northwestern region of the Pennsylvania, and the consolidation of the Mansfield and Fort Wayne divisions, effective March 16, the following changes have been made: **G. R. Barry**, formerly division superintendent at Fort Wayne, Ind., has been appointed division engineer, with headquarters at Logansport, Ind., succeeding **F. M. Hawthorne**, who has been appointed assistant division engineer. **W. R. Hillary**, engineer maintenance of way, with headquarters at Toledo, has been appointed division engineer, with the same headquarters, succeeding **J. K. Sherman**, who has been transferred to Grand Rapids, Mich., succeeding **T. L. Doyle**, who has been appointed assistant division engineer, with the same headquarters. **R. G. Jones**, division engineer at Mansfield, has been appointed assistant division engineer at Fort Wayne.

Purchasing and Stores

L. J. Green, formerly assistant general storekeeper on the New York Central at West Albany, N. Y., has been appointed storekeeper at Otis, N. Y., succeeding **F. C. Vroman**.

R. S. Huffman, assistant general storekeeper on the New York Central at West Albany, N. Y., has been appointed district storekeeper, with headquarters at the same point, succeeding **J. H. Seim**, transferred.

W. H. King, Jr., assistant to the vice-president in charge

of operation of the Seaboard Air Line, has been appointed general purchasing agent, succeeding **H. C. Pearce**, resigned to enter the service of another company.

B. W. Griffeth, former assistant general storekeeper on the New York Central at Collinwood, Ohio, has been appointed district storekeeper, third district, with headquarters at Collinwood. Mr. Griffeth succeeds **F. J. McMahon**, who has been assigned other duties in the stores department at the same point.

H. C. Pearce, general purchasing agent of the Seaboard Air Line, has resigned to become director of purchases and stores of the Chesapeake & Ohio with headquarters at Richmond, Va., effective April



H. C. Pearce

10. Mr. Pearce was born on June 1, 1867, at Westberry, Quebec, and was graduated from St. Charles-Baromme College at Sherbrooke, Quebec. He entered railway service in 1885 as a clerk in the office of superintendent of the Minneapolis, Lyndale & Minnetonka and subsequently served as a material clerk and conductor on the same line. In 1887 he went with the Minneapolis, St. Paul & Sauli Ste. Marie as a clerk to the superintendent of construction. He later served as a clerk in the auditor's office, chief

clerk to general superintendent, general storekeeper and purchasing agent. He went with the Chicago, Rock Island & Pacific in April, 1903, as assistant purchasing agent. The following year he was appointed general storekeeper and remained in that position until 1906, when he resigned to enter the service of the Southern Pacific in a similar capacity. In 1913 he became general purchasing agent of the Seaboard Air Line and remained in that position until his present appointment. Mr. Pearce is chairman of the division of purchases and stores of the American Railway Association.

Special

John A. McGrew, whose appointment as superintendent of maintenance of the Delaware & Hudson was announced in the *Railway Age* of April 8 (page 916), was born June 8, 1873, at Bridgewater, Ohio. He was graduated in civil engineering from Ohio State University in 1895. He entered railway service in 1894 with the Columbus & Westernville Electric. Upon his graduation from college he became assistant superintendent of construction of that company and held that position until November, 1896, when he resigned to enter the engineering department of the Pennsylvania at Wellsville, O. From 1899 to 1901 he was assistant engineer, maintenance of way, at Logansport, Ind. From 1901 to 1903 he was engineer, maintenance of way, with the same headquarters. He then went to Pittsburgh, Pa., in the same capacity. For six months in 1904 he was special agent for the general manager of the Chicago, Rock Island & Pacific at Chicago. From 1904 to 1909 he was a consulting engineer and contractor at Columbus, Ohio, and subsequently president of the National Engineering Company. In September, 1909, he went with the Delaware & Hudson as inspector of maintenance on its lines, allied lines and controlled street railways. In 1910 he was appointed superintendent of the Saratoga and Champlain divisions, with headquarters at Albany, N. Y. In July, 1917, he entered the army as a consulting quartermaster in the construction division. In July of the following year he served as a major of engineers in the railway division of the American Expeditionary Forces. Mr. McGrew was discharged from the army on February 21, 1919, and returned to his position as superintendent of the Delaware & Hudson in April, 1920. He was holding this position at the time of his recent promotion.